A LIBRARY OF SOFTWARE PROGRAMS FOR APPLE II, II+, IIe COMPUTERS

A+ DISK MAGAZINE

VOL. 1 NO. 1 PREMIER ISSUE $29.95

USER'S MANUAL AND DISKETTE INCLUDED

- BAR CHARTER: CONVERTS NUMBERS INTO AN EFFECTIVE GRAPHIC
- TRANSPARENT SORT: TUTORIAL FOR THE SHELL/METZNER SORT
- SEA BATTLE: EXCITING NAVAL GAME ACTION
- LOAN ANALYZER: COMPUTERS REPAYMENT TERMS

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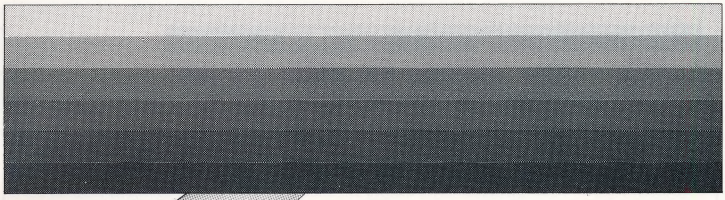

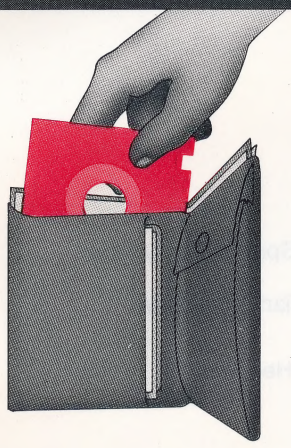

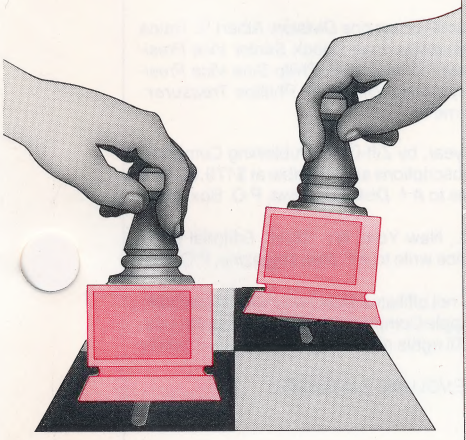

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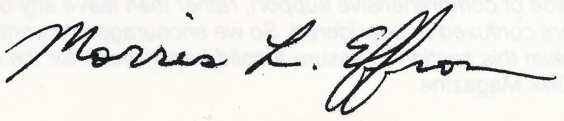
FROM THE EDITOR

Welcome to *A+ Disk Magazine*, the first computer magazine to regularly bring you ready-to-run software for your Apple II, II+, and IIe Computers. In each issue you will find an editorial diskette containing programs, subroutines, and data files. The accompanying manual provides the explanations and instructions needed to make full use of the software. Since every issue will contain new and original materials, *A+ Disk Magazine* offers a unique opportunity for you to compile a library of quality software at an attractive price.

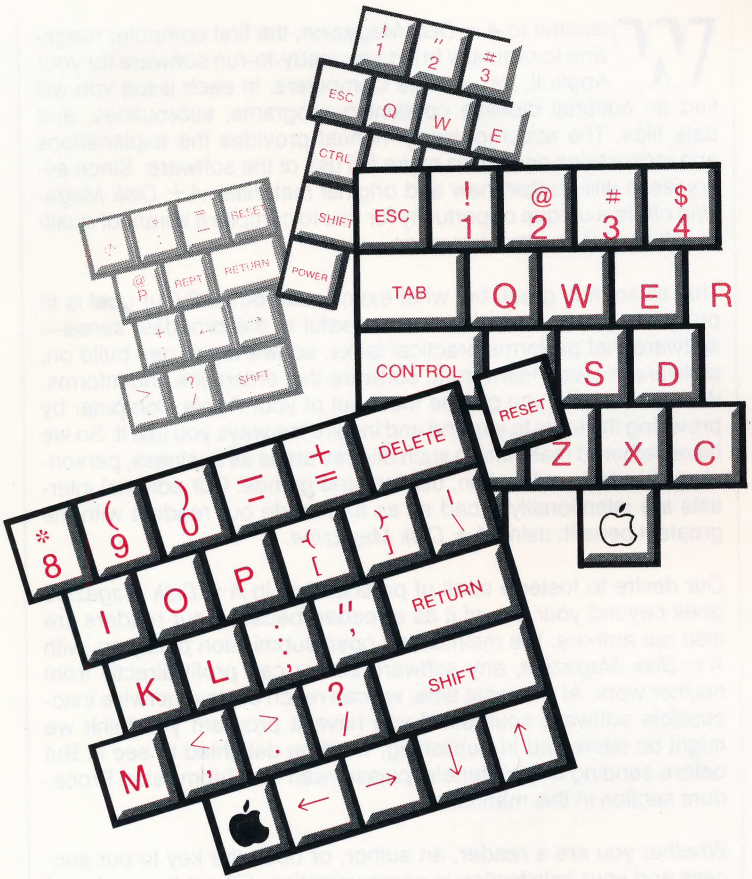
That all sounds great, but what exactly do you get? Our goal is to provide you with software that is useful in the broadest sense—software that performs practical tasks, software you can build on, software you can learn from, software that entertains and informs. We want to help you get the most out of your Apple Computer by providing the tools to expand and inspire the ways you use it. So we have gathered materials in such diverse areas as business, personal applications, education, utilities, and games. Our editorial interests are intentionally broad so as to provide our readers with the greatest benefit: using *A+ Disk Magazine*.

Our desire to foster a spirit of participation in *A+ Disk Magazine* goes beyond your use of it as a reader, because our readers are also our authors. We maintain an open submission policy so, with *A+ Disk Magazine,* any software author can profit directly from his/her work. At the same time, we can reach out to otherwise inaccessible software sources. If you have a program you think we might be interested in publishing, we'd be delighted to see it. But before sending any materials, please read the Submission Procedure section in this manual.

Whether you are a reader, an author, or both, the key to our success and your satisfaction is communication. Fill out the enclosed questionnaire so we can get to know you. And tell us what you think of the contents of this our premier issue. We look forward to hearing from you now and in the future, and hope you put your first issue of *A+ Disk Magazine* to good use.



TECHNICAL PREFACE



To help our readers make the most of A+ Disk Magazine, *we would like to provide some background information concerning the editorial diskette, the accompanying manual, and how to use both. We don't expect all of the following topics to be of interest to all our readers. Nevertheless we have preferred to err on the side of comprehensive support, rather than leave any of our readers confused or bewildered. So we encourage everyone to at least skim this section to assure a solid background for the use of* A+ Disk Magazine.

USAGE REQUIREMENTS

A+ Disk Magazine has been designed for use on any Apple II, II+ or IIe personal computer with at least 48K of main memory and the following minimum hardware requirements: a keyboard, a monitor,

and a disk controller with at least one disk drive. The display unit can be either a monochrome monitor, a color monitor, or an RF Modulator and TV set. All software is designed for a 40 column display, so that an 80 column card is not needed.

This equipment is all you need to run the majority of *A+ Disk Magazine* software. Wherever possible, we make any other hardware optional. When on occasion a program's design necessitates additional equipment, the manual will list this component as a "Special Requirement" on the program's title page.

All *A+ Disk Magazine* programs run under Apple DOS 3.3. Furthermore, all BASIC programs in the magazine run under Applesoft BASIC. DOS is included on the *A+ Disk Magazine* diskette. Applesoft BASIC is assumed to be resident in your machine's firmware. DOS 3.3 and Applesoft BASIC are the only software elements needed to use most of the *A+ Disk Magazine* programs. Any additional software requirements, such as "Apple Integer BASIC" or specific application software will be listed as a "Special Requirement" on the program's title page in this manual.

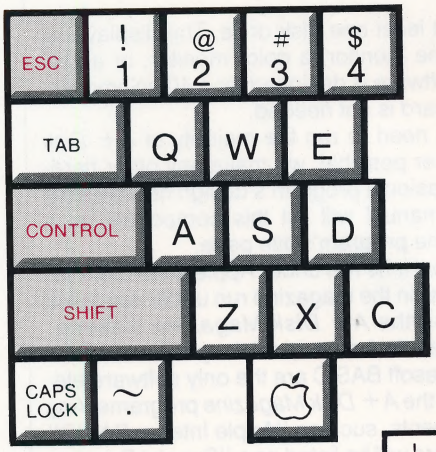
Our closing remark on this topic is a recommendation that you make a copy of your *A+ Disk Magazine* diskette to work with, and save the original as a backup. In certain specified cases, you must make a copy of a program in order to use it. For example, some programs create additional files as they run, and these files must be stored on diskette as well. Since your *A+ Disk Magazine* diskette is write protected, it cannot receive these additional files, hence the need for a work copy. In general, therefore, when the manual refers to "your *A+ Disk Magazine* diskette" you should read "your working copy of the *A+ Disk Magazine* diskette."

Note: It is important that you exit the programs of *A+ Disk Magazine* via the exit procedure provided by the program, rather than by breaking out with an interrupt. The reason is that many *A+ Disk Magazine* programs reset various operating parameters of your Apple for their own purposes. Upon normal termination, each program will "clean up after itself" so to speak, resetting the various system parameters to their start-up status. If you interrupt a program, these parameters are not reset, and you may encounter problems in your subsequent program use.

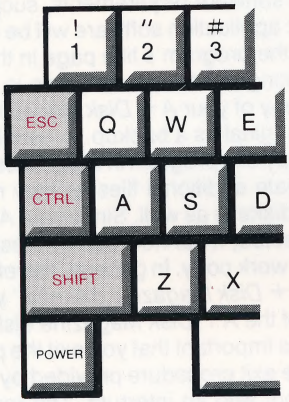
THE APPLE KEYBOARD

In *A+ Disk Magazine*, we have consistently used special key symbols to make our instructions as clear as possible. The characters generated by the Apple keyboard include many common typewriter keys, which we print as they would appear when typed. The Apple keyboard's special keys are designated by symbols intended to resemble the keys themselves. Since these symbols appear extensively throughout the instructions, we felt the following road map and glossary would help you, our reader, get any necessary bearings.

As noted above, we have designed our software to use only those special keys common to both the II, II+ and IIe keyboards. In most cases these special keys look the same on both keyboards, although their locations may differ. However, the CONTROL key looks different on the two keyboards, and we have therefore created a hybrid symbol, appearing below, to represent this key.



Left side of Apple IIe keyboard



Left side of Apple II, II+ keyboard

ESC **THE ESCAPE KEY**

The ESCAPE key is used most often for exactly what its name implies—to escape (exit) from various functions and processes.

CONTROL **THE CONTROL KEY**

This key appears as CTRL on the Apple II, II+ keyboard, and as CONTROL on the IIe keyboard. We have therefore adopted the hybrid symbol "ConTRoL" to represent this key for both keyboards. The CONTROL key is always used in conjunction with another key by pressing it and the other key simultaneously. The purpose of the CONTROL key varies widely depending on the application program.

SHIFT **THE SHIFT KEY**

The SHIFT key, located on either side of the keyboard, is used with other keys to get special symbols and punctuation marks (for example, !, @, #, $, %, ^, and &).

Right side of Apple IIe keyboard

Right side of Apple II, II+ keyboard

RETURN **THE RETURN KEY**

This is the most frequently used key on the keyboard, since you must press it almost every time you need to give information to the computer. Since it is similar to the return key on a typewriter, you can think of it as the carriage return.

← **THE LEFT-ARROW KEY**

The Left-Arrow key is used to correct typing errors. Pressing the key once erases the preceding character so that a new character can be entered. It is also used at times for cursor positioning or game operation.

→ **THE RIGHT-ARROW KEY**

This key moves the cursor on the screen one character to the right. Any character it passes over is treated as if it were entered from the keyboard. It is commonly used to enter a line already displayed on the screen or as a game control.

TERMINOLOGY

In the preceding section we named and defined the special key symbols used in this manual. In our instructional narrative, it sometimes makes more sense to refer to a special key by its name rather than its symbol. Thus the key names of the preceding section are also special terms in this manual. Familiarize yourself with the names to simplify using the manual, and refer to the preceding section when necessary.

In the manual, our START-UP section commonly says that in order to run the program "you should be in Applesoft BASIC under DOS 3.3" This means that prior to running an *A+ Disk Magazine* program, you must boot your computer using either your *A+ Disk Magazine* diskette or another system diskette which will load DOS 3.3 into your computer. You should make sure that after booting you see the right bracket, "]", prompt indicating that you are in Applesoft BASIC.

TEXT CONVENTIONS

Most of the textual conventions of this manual are fairly obvious. Besides the special key symbols and names discussed above, command lines also deserve mention.

The lines appearing in bold print and in a different color from the narrative text are commands, and should be typed in exactly as they appear. When two symbols appear next to each other in such a command line, they should be pressed simultaneously (i.e. type the second symbol while holding down the first symbol).

There is one exception to typing in command lines exactly as they appear. When a command includes a phrase such as "somename" or "yourfile" or "programname," you should, when you enter the command, replace that name (but not any punctuation) with a valid file name of your choice. (A valid file name consists of one to thirty characters in length and must begin with a letter).

HARDWARE DIFFERENCES

Although all the programs in *A+ Disk Magazine* will run on both the Apple II, II+, and the Apple IIe, there are some differences between these machines. Most obviously, the Apple IIe supports both uppercase and lowercase letters, while the II and II+ supports only uppercase. Additionally, there are certain keys available on the Apple IIe which are not available on the II and II+.

In order to ensure software compatibility and consistency across all three machines, we have elected to limit ourselves to the features available on the Apple II and II+. Therefore our programs will use only uppercase letters and will use only the keys that are common to both the Apple II and II+ keyboard as well as the IIe. If any program in an issue should depart from this standard, the relevant differences will be stated explicitly in the accompanying article in the manual.

Note: When using the *A+ Disk Magazine* on an Apple IIe, you should always have your CAPS LOCK key down so that all interaction with the computer will be in uppercase.

PROBLEM RECOVERY

There really is not a great deal to say about problem recovery with *A+ Disk Magazine*. If you use this software on the right equipment

running the appropriate system software, as outlined above, you should experience no problems. Nevertheless, a few comments may resolve some of the more obvious difficulties.

Any Applesoft BASIC program can be interrupted at any time by pressing:

on the Apple II and II+, or

on the Apple IIe. If you do not see the Applesoft prompt "]" immediately, indicating that you are back in Applesoft BASIC, press these keys again. This is a rather drastic but effective way of regaining control of the computer. You won't damage any of the programs in this way, since they're still intact on the diskette. However, you will lose any data entered while the program was running.

If you try to send something to the printer where there is no printer, or when the printer is off, you will hang the system. The computer will just sit there and will not respond to any keys pressed. If your printer is simply off, you can turn it on and printing will begin. Otherwise you will have to say goodbye to whatever you were doing and re-boot your system.

Though we hope you will never need it, if you should find a "bug" in an *A+ Disk Magazine* program, the address to write to is:

A+ Disk Magazine
Problem Recovery
One Park Avenue
New York, NY 10016

Beginning with our next issue, we will introduce a notes file on our editorial diskette, along with an accompanying read program, to address any problems in prior issues that have come to our attention. Next issue will provide more details on how to access this file. The purpose of this software column is to clarify any procedural confusion, as well as offer fixes to any "bugs" that are uncovered. We hope that this column will provide quality support to our readers.

MERGING THE CODE

To move a block of code from one Applesoft BASIC program to another (for example, to merge two of your programs or to insert a separate subroutine into your program) you can use the RENUMBER program on the DOS 3.3 System Master diskette. The operating instructions for this program are also contained on the DOS 3.3 System Master diskette, under the program name RENUMBER INSTRUCTIONS. You may run this program for a detailed discussion of the features available. Our discussion here concerns only merging program code.

The general procedure to combine two blocks of code is as follows:

1. Start the RENUMBER program.

2. LOAD the program block to be merged into memory.

3. Tailor this block (i.e. use the DEL command to delete lines) and renumber it (with the &F command) as necessary.

4. Put this program block in RENUMBER's hold buffer with the &H command.

ED 2003M

5. LOAD the program with which this block is to be merged into memory.

6. Merge the code in the hold buffer with the program code in memory using the &M command.

7. SAVE the resulting program.

There is one note of caution to observe here. If there are any duplicate line numbers in the two program sections to be merged, RENUMBER will retain both lines in the resulting program, one after the other. The result can be a scrambled combination of the two program blocks. Therefore, before you put a program block into the hold buffer be sure to delete all extraneous lines and renumber the block with the line numbers you know will not conflict with the destination block.

An example using *THE PERPETUAL CALENDAR* in this issue may be helpful. First insert the System Master diskette in the default drive and type:

RUN RENUMBER RETURN

After the summary screen is displayed press:

RETURN

to continue. You should now see the Applesoft BASIC prompt again. Replace the System Master diskette with your *A+ Disk Magazine* diskette and type:

LOAD PERPCAL RETURN

As discussed in the article on the *THE PERPETUAL CALENDAR* the two key subroutines of interest are in lines 3000-3170 and lines 3200-3450. The initialization routing in lines 430-920 is also needed. With the entire program in memory, the next step is to delete the extraneous lines. Type:

DEL 1,425 RETURN

DEL 940,3049 RETURN

DEL 3470,3560 RETURN

With the deletion done, renumber this extract with a starting line number well above any lines in the destination program. Type:

&F 10000 RETURN

Bear in mind that the starting line numbers for all three subroutines have now been changed. Continue the merge operation by storing this extract in the hold buffer. Type:

&H RETURN

Lastly, load your destination program into memory, and merge in the extract by typing:

LOAD yourfile RETURN

&M RETURN

Now save your new (merged) program by typing:

SAVE somename RETURN

BUSINESS

LOAN ANALYZER

By Zyncon Inc.
Programmed by Jason Winshell

Special Requirements: None
Files Used: LOANS

Interest rates have just dropped. How will this affect the car loan you've applied for and the monthly mortgage payments on the house you're negotiating to buy? How might increasing the term of your loan affect the amount you can borrow, given the maximum monthly payment you can make? If you don't want to spend the day doing calculations, you need LOAN ANALYZER.

You supply LOAN ANALYZER *with three of four key loan features —interest rate, amount borrowed, duration of the loan, and payment per period—and it will compute the value of the fourth. Once the program has calculated the dependent loan item, you have the option of requesting a detailed payback schedule.* LOAN ANALYZER *displays a period-by-period schedule of your payments on a*

second screen, 12 periods at a time. If you wish to change any loan parameter, the computer will quickly recalculate. In addition, you can have a complete payback schedule printed.

CONCEPTUAL BACKGROUND

The *LOAN ANALYZER* uses the "add-on" method for installment loan calculations. The total interest over the life of the loan is computed using an unchanging principal balance. This total interest is then added to the amount borrowed. The resulting sum is divided by the number of payment periods to obtain the payment per period. In the case of a balloon payment at the end of the loan, the total interest due remains the same, but the principal amount to be repaid is reduced by the amount of the balloon payment.

In the detailed payback schedule for an installment loan, the "payoff amount" is computed using the Rule of 78s. This widely used calculation method assigns to each payment period a declining proportion of the total interest due on the loan. Thus, you pay more interest but less principal in the beginning of your loan.

There are instances where the Rule of 78s cannot be applied because the interest apportioned to the early periods actually exceeds the period payment itself. In these cases, the *LOAN ANALYZER* computes a simple linear repayment of the loan, whereby the same fixed amount of principal and interest are paid in each period. Both the displayed and printed payback schedules will show the message "(Linear Decline)" at the top of the payback table when this special situation occurs.

THE "PAYOFF AMOUNT" IS COMPUTED USING THE RULE OF 78s

The program calculates mortgages using the traditional method of amortization. It computes interest in each payment period on a declining principal balance. In the case of a final balloon payment, it treats the balloon amount like an add-on loan over the life of the mortgage, adding a fixed interest amount to each period payment. The difference between the principal amount and the balloon amount is amortized in the traditional manner.

One warning in connection with the *LOAN ANALYZER:* There are limitations to the accuracy of arithmetic calculations in any computer language. The *LOAN ANALYZER* is written in BASIC, and BASIC offers good, but not deadly, arithmetic precision. Hence, you may notice some minor variation in the results when specifying different parameters for the same loan. This is due to the limitations of BASIC, not errors in your use of *LOAN ANALYZER.*

START-UP

To start *LOAN ANALYZER,* you must be in Applesoft BASIC under DOS 3.3. Then put the *A+ Disk Magazine* into your default drive and type:

RETURN

You will be asked if you have a printer. If you answer yes ("Y"), the program will ask what slot the printer is connected to.

LOAN SPECIFICATION

The first screen to appear is the loan specification screen.
You are first asked whether this is to be an installment loan or mortgage. Type "I" or "M" accordingly. At this point, the lower portion

of your screen will display the loan parameters you should enter, along with placeholding values for each parameter. Enter all numbers with no commas and type in the decimal point if your entry is not an integer. Push:

RETURN

after every entry to progress to the next parameter. To leave a parameter value unchanged, type:

RETURN

when the cursor is at the beginning of that parameter. To remove the value for a parameter (so that it becomes the item to be calculated), enter zero and press:

RETURN

This action will erase the item's current value. Finally, to replace a value, simply type in the new value.

The key loan parameters have a number associated with them in the left-hand margin. To use the *LOAN ANALYZER* you must fill in three of these four parameters. The other two loan parameters, "Final Balloon Payment" and "Payment Frequency," must be assigned values in the specification process; *LOAN ANALYZER* cannot calculate them. They are included in this lower portion of the screen to make it easy for you to examine other loan scenarios.

THE FIRST SCREEN TO APPEAR IS THE LOAN PARAMETER SCREEN

```
        INSTALLMENT PAYBACK SCHEDULE
        ============================

Amt  : $  45000.00          Rate: 13.000 %
Bln  : $   2500.00          Dur  : 15,00
Pmnt : $    723.61          Freq: Monthly
Annual consolidation      (Linear Decline)

 Y  |  Cumul.    |  Cumul.    |  Pay-Off
    |  Principal |  Interest  |  Amount
----------------------------------------
 1  |   3000.00  |   5683.32  |  42000.00
 2  |   6000.00  |  11366.64  |  39000.00
 3  |   9000.00  |  17049.96  |  36000.00
 4  |  12000.00  |  22733.28  |  33000.00
 5  |  15000.00  |  28416.60  |  30000.00
 6  |  18000.00  |  34099.92  |  27000.00
 7  |  21000.00  |  39783.24  |  24000.00
 8  |  24000.00  |  45466.56  |  21000.00
 9  |  27000.00  |  51149.88  |  18000.00
10  |  30000.00  |  56833.20  |  15000.00
11  |  33000.00  |  62516.52  |  12000.00
12  |  36000.00  |  68199.84  |   9000.00
      <N>, <P>, <R>, <E>※
```

The comprehensive, detailed payback schedule

The specification process in *LOAN ANALYZER* simply entails entering a value for each of these six loan parameters in sequence (or leaving the present value unchanged). Note that the key loan parameter, that is, the parameter to be calculated, must be set to 0. If you enter an incorrect value for a parameter, you cannot back up to correct it. You must cycle through the entire list of parameters again in order to make your change.

"Amount to Borrow" can be any amount up to $10 million. Enter a final balloon payment only if the loan will not be repaid in full by fixed, even payments. For "Annual Interest Rate," you can enter any two-digit number with up to three decimal places. "Duration of Borrowing" should be the integral number of years, 1 to 99, and the number of months, 1 to 12, separated by a comma. Enter the "Payment Frequency" using the values "M" for monthly, "Q" for quarterly, and "Y" for yearly payments. "M" is there by default. Finally, "Payment per Period" can be any dollar amount up to $1 million.

The *LOAN ANALYZER* does not validate your entries until you make the last entry, "Payment per Period." You will then see one of two messages at the bottom of your screen. If your specification is fine, the message "Parameters OK" will appear. If not, there will be a message telling you which parameter(s) are wrong. In either case, the cursor will go to the bottom of the screen to the right of the command prompt line.

THE LOAN ANALYZER WAITS UNTIL IT RECEIVES A COMMAND

CALCULATION

The *LOAN ANALYZER* is now in a wait state until it receives instructions. If you want the computer to calculate the missing parameter, and your specification is complete, type:

C

for "Calculate." If you want to change or correct a parameter, type:

RETURN

The cursor will return to the first parameter entry field so that you can cycle through the parameters again. If you want to start the specification process over from the beginning (for example, to examine another type of loan), press:

R

for "Restart" and the *LOAN ANALYZER* will present the first question ("Installment Loan or Mortgage"). To end the program, type:

Q

for "Quit." These commands are only valid when *LOAN ANALYZER* is in the wait state.

GETTING TO THE PAYBACK SCHEDULE

When you request calculation for a valid loan specification, the computer will compute the missing parameter. You can then choose whether to display the payback schedule for a maximum of 60 payback periods, displayed 12 periods at a time. If there are more than 60 payment periods, the *LOAN ANALYZER* will consolidate the period payments into annual totals. Hence, the duration of any loan must be 60 years or less in order to display a detailed payback schedule. After calculation, a question at the bottom of the screen asks if you want to see the display. Entering "N" for no sends the *LOAN ANALYZER* back to the wait state. Answering "Y" for yes leads you to the payback schedule screen.

THE PAYBACK SCHEDULE

The payback schedule lists the loan parameters at the top of the screen. If the payment periods have been consolidated to annual

totals, there will be a message after the parameters stating that the periods represent annual consolidations. If the loan is an installment, and the Rule of 78s does not apply (see discussion above), a "(Linear Decline)" message will appear as well. Then 12 payment periods will be displayed. For an installment loan the columns will be "Cumulative Principal Paid," "Cumulative Interest Paid," and "Payoff Amount." A mortgage will have the columns "Cumulative Principal Paid," "Cumulative Interest Paid" and "Unpaid Principal." To advance through the payback schedule 12 periods at a time, press:

N

for "Next." To view the previous 12 periods, press:

P

for "Previous." You can also print a complete payback schedule, on a nonconsolidated basis, on your printer by pressing:

R

Even if the screen display is consolidated, this printed schedule will not be.

You can return to the *LOAN ANALYZER* Specification screen at any time by typing:

E

```
L O A N   A N A L Y Z E R --  INSTALLMENT LOAN PAYBACK SCHEDULE
================================================================

              Amount: $   45000.00 | Annual Interest Rate: 13.000 %
Final Balloon Payment: $    2500.00 | Duration of Borrowing: 15.00 YY.MM
   Payment per Period: $     723.61 |    Payment Frequency: Monthly
                       (Linear Decline)

                 :    Cumul.    :    Cumul.    :   Pay-Off
          Month  :  Principal   :   Interest   :   Amount
        ---------------------------------------------------
              1  :     250.00   :     473.61   :  44750.00
              2  :     500.00   :     947.22   :  44500.00
              3  :     750.00   :    1420.83   :  44250.00
              4  :    1000.00   :    1894.44   :  44000.00
              5  :    1250.00   :    2368.05   :  43750.00
              6  :    1500.00   :    2841.66   :  43500.00
              7  :    1750.00   :    3315.27   :  43250.00
              8  :    2000.00   :    3788.88   :  43000.00
              9  :    2250.00   :    4262.49   :  42750.00
             10  :    2500.00   :    4736.10   :  42500.00
             11  :    2750.00   :    5209.71   :  42250.00
             12  :    3000.00   :    5683.32   :  42000.00
             13  :    3250.00   :    6156.93   :  41750.00
        ---------------------------------------------------
             48  :   12000.00   :   22733.28   :  33000.00
```

A completed loan specification screen

THE DURATION OF ANY LOAN MUST BE 60 YEARS OR LESS FOR A DETAILED PAYBACK SCHEDULE TO BE DISPLAYED

When you do so, the current loan specification will reappear, and the *LOAN ANALYZER* will be in the wait state. You may then exit the program by typing:

Q

Or you may change a parameter, going through them again, by pressing:

RETURN

Or you may start a new specification by pressing:

R

PUBLISHING PHILOSOPHY

A quick look at the editorial diskette for this premier issue of *A+ Disk Magazine* reveals a fairly radical editorial decision: all BASIC programs have been published in unprotected source code. Consequently, these programs can be listed and copied in their entirety. We at *A+ Disk Magazine* have chosen neither to copy-protect our offerings, nor to make our program code inaccessible—a rather sharp departure from traditional software distribution.

WHY?

The most important reason behind our decision is our desire to make *A+ Disk Magazine* of the greatest possible use to you. This desire involves several considerations. First, we want you to be able to learn from these programs. To do so you must be able to study the source code in order to understand the design concepts and programming techniques employed. Second, we want you to be able to adapt these programs to your own needs. You may choose to modify some programs, or expand them, or include them in programs of your own. Once again, you need the source code to do this. The third consideration is that to have the flexibility to use *A+ Disk Magazine* most extensively, to modify and expand programs, to create different versions and to experiment, you must be able to make copies of *A+ Disk Magazine* materials. Thus, our objective—to establish the closest possible relationship between this magazine and its readers—was the most compelling reason to publish copy-able source code.

Now that you understand the reasons for our decision, we hope you will minimize our risk by honoring the legal copy restrictions that apply to *A+ Disk Magazine*. Use the magazine as extensively as you like for yourself, but do not give listings or copies of our software materials to others. Be aware that the contents of *A+ Disk Magazine* are copyrighted private property. Your technical freedom to copy these materials implies no legal right to distribute them. We ask that you act responsibly in your use of *A+ Disk Magazine* and not abuse the spirit of free exchange. For our part, we will continue to make our material as useful to you as possible, with the expectation that, properly understood, this policy will best serve you our readers.

BUSINESS

BAR CHARTER

By Mirror Images Software Inc.
Programmed by David Wolff

Special Requirements: None
Files Used: BARCHARTER
GRAPH.BINARY
BAR.GRAPH.GENERATOR

With BAR CHARTER *you can quickly turn numbers into a horizontal bar graph that displays the data in an easy-to-understand form. No drawing, cutting, pasting, or programming is necessary—just type in the data and* BAR CHARTER *does the rest. Changing a graph or adding data to it later are simple operations, and so is saving the graph for later use.*
With BAR CHARTER *you can plot up to six separate horizontal bars.*

BACKGROUND

It is much easier to study numerical information when it is organized in an orderly way. One of the most popular techniques for organizing numerical data is the bar graph, which allows you to compare related items at a glance by noting the lengths of the bars.

START-UP

To use *BAR CHARTER*, you must be in Applesoft BASIC under DOS 3.3. Then place your *A+ Disk Magazine* diskette into your default drive and type:

RUN BARCHARTER RETURN

RUNNING THE PROGRAM

BAR CHARTER begins with a simple three option menu:

1. Create New Graph
2. Retrieve Old Graph
3. Return to Applesoft BASIC

If you select option 1, you will proceed directly to the activity menu. Selecting option 2 will cause the computer to prompt you for the name of the bar graph to retrieve. *BAR CHARTER* appends a suffix of ".BAR" to the files you create, to facilitate the identification of bar graph files. However, when you save or retrieve files with *BAR CHARTER*, you need only specify the primary name, effectively ignoring the ".BAR" suffix. When you specify a bar graph file that is on the diskette in your default drive, the information for that graph is retrieved, and you proceed to the activity menu. Option 3 from this initial menu ends the program and leaves you in Applesoft BASIC.

SELECT OPTION 1 TO CREATE A NEW GRAPH

Begin by selecting option 1 from this main menu to create a new graph. The activity menu that then appears offers the following choices for bar graph manipulation:

1. Enter/Change title and axis labels
2. Enter/Change data prefix or suffix
3. Enter/Change data
4. Change horizontal axis scaling
5. Change color option
6. Display bar graph
7. Save bar graph
8. Return to Main Menu

We recommend that you try each of these activities so that you become more familiar with this program's operation.

First select option 1 from the activity menu. The program will display a full screen asking for three labels. The first label is a title for your bar graph. This should indicate the general nature of the data being shown, and must not exceed a length of 38 characters. When you have entered your title press:

RETURN

and the prompt will move to the following label item. Next, enter a label for the vertical axis. For example, if your title were "Births at

Newton Hospital (1979-1983),'' this label would be ''Year.'' Type the label, then press the RETURN key. Finally, enter a label for the horizontal axis. This will identify the numbers that determine the length of the bars. For our example, it would be ''Number of Births.'' Type the label and again press the RETURN key.

The next screen shows the title and labels you have entered and asks if they are correct. If you wish to make changes, type:

N RETURN

The previous screen will reappear with the information you typed in. Just type over what you want to change and press RETURN. If you decide not to make any corrections for a given label, press only the RETURN key. When you've gone through the three labels, the program will once again ask if your labels are correct. By pressing:

Y RETURN

you will return to the activity menu.

TYPE THE LABEL, THEN PRESS THE RETURN KEY

The second selection on the activity menu allows you to add a prefix or suffix to the numeric information you provide for your graph. These are symbols that will be attached to the data values appearing in each bar of your graph. The dollar sign is a common prefix, especially in graphs of economic data. Type in the desired prefix and press the RETURN key. If you do not want any prefix symbol for your data, simply press RETURN. Follow the same procedure to enter a suffix. The program will then display your choices and allow you to alter them.

You can now proceed to enter the data for each of the bars, one bar at a time, by selecting option 3 from the activity menu. A maximum of six bars can appear on the graph. When you have finished all the bars, enter an empty line by pressing the RETURN key alone.

For reasons to be discussed shortly, numbers with more than three or four digits are best avoided. It is preferable for example to write 105 and indicate in the horizontal axis label that data is presented ''in thousands'' than to write 105000 on a bar. Also remember not to use commas in your entries. If you do include commas, the program will accept only the information in front of the comma.

Next you must scale the horizontal axis by selecting option 4 from the activity menu. It is best to divide the axis into between two and ten equal segments. If you wish, you can leave this task to the program's automatic scaler. The program will decide what the rightmost marker value must be, then suggest a size value for each intermediate segment and indicate the resulting number of segments. If you want automatic scaling, type:

Y RETURN

If you want a different scaling, type:

N RETURN

and indicate the desired value between markers. It is preferable to choose a value within the parameters indicated on the screen.

The program's automatic scaling function works only within a specific numerical range. If your data falls outside this range, the program will say so, then tell you what your scaling options are and ask you to enter a new scaling value. For example, if you have bars representing six months of sales figures ranging from $105000 to

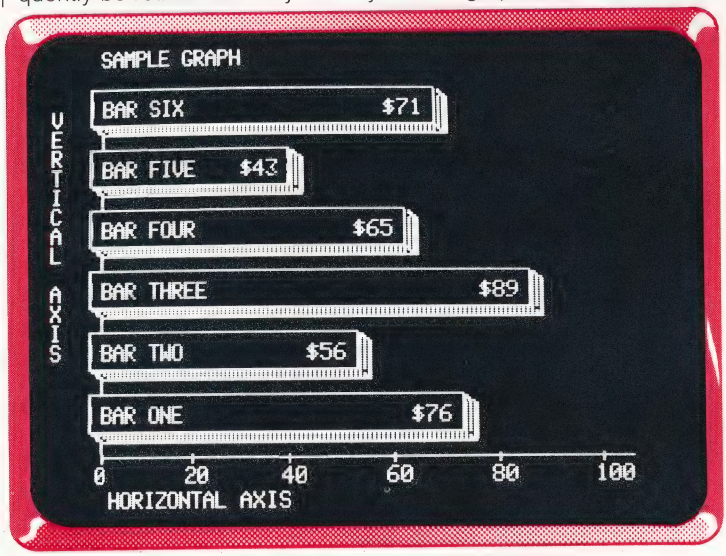
$756000, the program will tell you that the size value for each segment should be between 75600 and 378000. If you choose 75600, the axis will have ten segments. If you choose 378000, it will have two segments.

If there are ten markers on the horizontal axis, their values should not contain more than three digits. If they do, the print for the markers will overlap and be illegible. Instead, try using only two or three segments. The program will allow you to change axis labels and numerical data so that you can have a more manageable horizontal scale.

STORE THE BAR CHART ON DISK

Option 6 on the activity menu will now display your bar graph, which will remain on your monitor until you press RETURN. Once you have returned to the activity menu, you may go back and change any of the features of your graph. If you have a color monitor, you might want to take advantage of the bar shading option (activity 5).

If you are satisfied with your bar chart,you can store it on disk for future reference. To do this, simply select option 7 and respond to the prompt by typing in a name for your graph. If a file of the same name already exists on your disk, the computer will ask you to confirm that you want to replace this file. The saved file can subsequently be retrieved at any time by selecting option 2 on the main menu. Once you have called up an old graph, any of its features can be changed with any of the activity menu options.

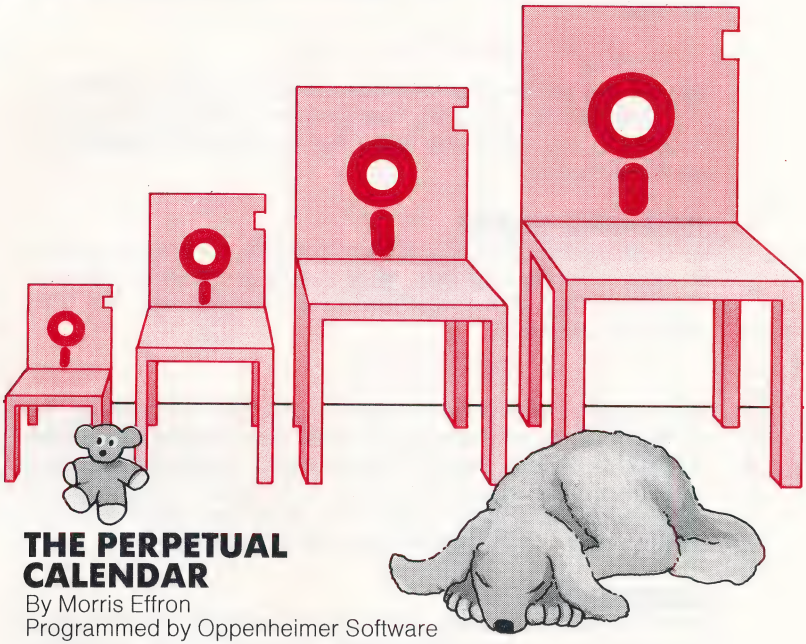


Sample bar graph

EXITING

Option 8 on the activity menu, "Return to Main Menu," should be chosen after you have finished creating a graph. Remember that if you wish to save the graph that you have been working on, you must do this before you select option 8. When you return to the main menu, you may then select option 3 to exit the program.

PERSONAL



THE PERPETUAL CALENDAR

By Morris Effron
Programmed by Oppenheimer Software

Special Requirements: None (Printer optional)
Files Used: PERPCAL

What day of the week were you born? How many days have you been alive? What was the calendar for the month you were born? You don't know? Use THE PERPETUAL CALENDAR *to find out.*

With the PERPETUAL CALENDAR *you can find the day of the week for any date from January 1, 1800 to December 31, 2800; you can determine the number of days between any two dates in this time range; and you can print the calendar for any month within these years. You simply select which of these three items you want to know, type in the relevant date(s) and you have the results immediately.*

In case you don't have unbounded interest in the calendrical details of your life or those of others, THE PERPETUAL CALENDAR *offers more. It has been programmed so that you can extract the "date validation" and "elapsed days" subroutines and include them in programs of your own. Thus, anytime you have a program-*

ZD 2003M

ming need for processing based on the day of the week, or days between two dates, don't re-invent the wheel—use THE PERPETUAL CALENDAR.

START-UP

To start *THE PERPETUAL CALENDAR,* you must be in Applesoft BASIC. Then put the *A+ Disk Magazine* diskette in the default drive and type:

RUN PERPCAL RETURN

You will now see the three-item menu of activities for *THE PERPETUAL CALENDAR.* Type in the number of the activity you would like to perform. (You need only press the number itself; the RETURN key is not needed.)

ENTERING DATES

Each of the activities will first ask you for a date. For the computation of weekday or elapsed days, dates should be entered in the form "Month #/Day #/4 Digit Year." For example, May 16, 1865 should be entered as

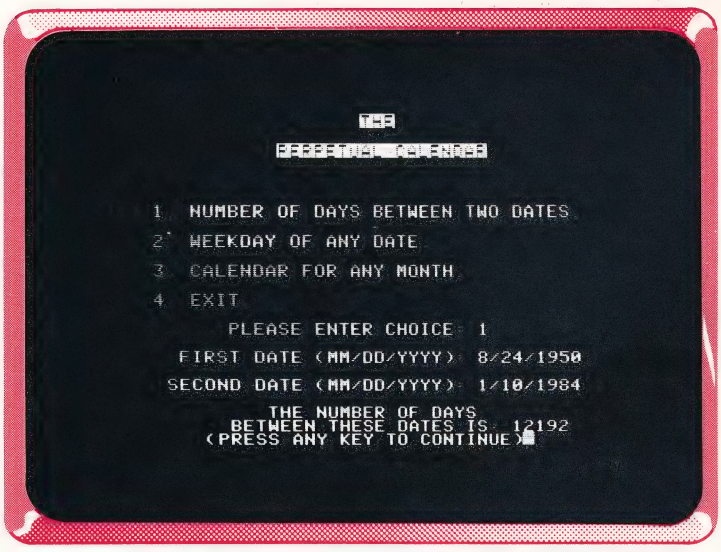
5/16/1865 RETURN

YOU CAN ENTER THE DATES IN ANY ORDER

(Don't forget to type in the slashes.) For the date of a calendar, the day of the month is not necessary, so the date format is abbreviated to Month #/4-Digit Year. You will be asked to enter two dates for the elapsed days activity. You can enter the dates in any order; the computer will determine which is the earlier and which the later. Only one date is necessary for the other two activities.

EXECUTION

Once you supply the dates, the computer spins the Great Mandala and gives you an answer immediately. If you have chosen to print a


1 NUMBER OF DAYS BETWEEN TWO DATES
2 WEEKDAY OF ANY DATE
3 CALENDAR FOR ANY MONTH
4 EXIT
PLEASE ENTER CHOICE: 1
FIRST DATE (MM/DD/YYYY): 8/24/1950
SECOND DATE (MM/DD/YYYY): 1/10/1984
THE NUMBER OF DAYS
BETWEEN THESE DATES IS: 12192
(PRESS ANY KEY TO CONTINUE)

Sample execution—the number of days between two dates

calendar, the computer pauses until you press a key to indicate that printing should begin. When the activity is completed, and the result printed or displayed, you are asked to press any key to continue. Doing so will return you to the first prompt for the activity you are in, allowing you to repeat the activity for different dates. For example, you select the "Weekday of Any Date" activity and enter 12/7/1941. The computer tells you that December 7, 1941 was a Sunday, and prompts you to continue by pressing any key. When you do so, you are returned to the prompt for the date. You can now enter another date for which you wish to know the day of the week.

When you want to exit from an activity, press:

RETURN

by itself as the response to the first prompt within an activity. This initial "null" response will send you back to the main menu so you can select another activity. If you make a mistake while selecting an activity, just press:

RETURN

in response to the activity's first question to return to the main menu and reselect. Choice four on the main menu allows you to exit from the program and return to BASIC.

THE SUBROUTINES

The two key subroutines of *THE PERPETUAL CALENDAR* are the "date validator" and the "elapsed days calculator." The former is lines 3000-3170. The latter is lines 3200-3450.

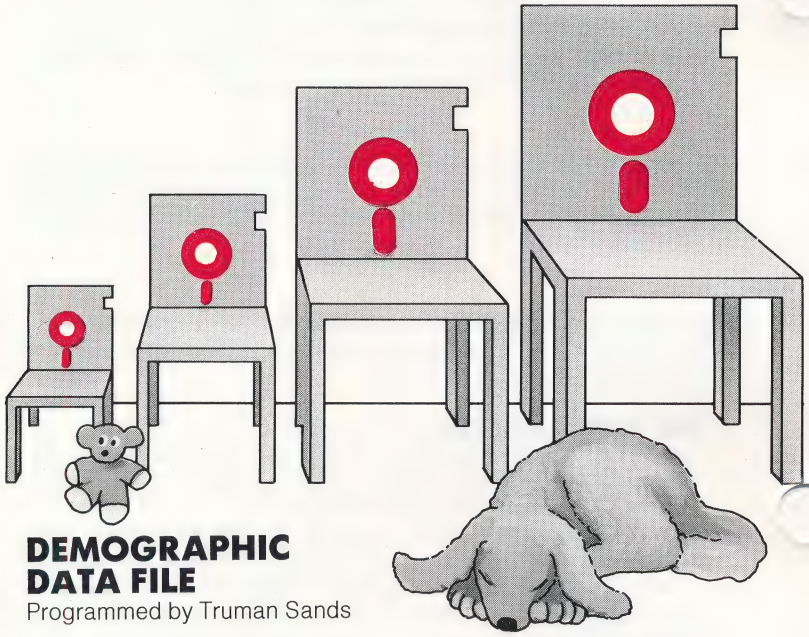
The date validator takes the character string in the variable AD$, and verifies that it is in the form MM/DD/YYYY. It uses the flag OKd to tell the main program that the date is valid (if OKd is 0 (zero) the date is no good, otherwise it's okay). During date validation, three integer variables—D, M, and Y—are assigned the numeric day, month, and year portions, respectively, of the string AD$. In addition the variable LP is set to 1 (one) if the year of this date is a leap year, otherwise it's set to 0 (zero).

THE TWO KEY SUB-ROUTINES ARE THE DATE VALIDATOR AND THE ELAPSED DAYS CALCULATOR

The "elapsed days calculator" uses dates that have already been broken into their numeric day, month and year components by the date validator. The components for one date are in the variables D1, M1, and Y1; for the other date D2, M2, and Y2 are used. The elapsed days calculator begins by determining which is the earlier date, and then computes the number of days from the earlier to the later date and puts this result in the variable TDS.

Both subroutines use the array DS, which is a 12-element array containing the number of days in each month of the year. The need for this information to verify dates and compute elapsed days is obvious. In addition, the elapsed days calculator uses a seven-element array NL, which contains a list of centenary years that are not leap years. This list is needed to adjust the total elapsed days downward if any of these years lie between the two end dates in question. This is not an exhaustive list of such years; it contains only those that fall between 1800 and 2800. Both these reference arrays, DS and NL, are dimensioned and filled in the initialization subroutine, lines 430-920. Hence, you should copy this initialization section into your program when using either the date validator or elapsed days calculator in your own application.

PERSONAL



DEMOGRAPHIC DATA FILE

Programmed by Truman Sands

Special Requirements: None
Files Used: DEMOSTAT.DAT
DEMOREAD

If you've ever wondered what the odds are of getting divorced in New Jersey, what the likelihood is of being poor in Iowa, how many people live on the same square mile of land you're thinking of living on in Colorado, or what the odds are of meeting that special person in Oklahoma, THE DEMOGRAPHIC DATA FILE *is for you. It's an ideal tool for students, planning professionals, and curious home users.*

THE DEMOGRAPHIC DATA FILE *provides 15 items of demographic information by state, from the official 1980 U.S. Census. In addition to the data file itself, there is a small program that reads the data in memory and allows data lookups by state. With this program you can look at and manipulate the demographic statistics, as well as use the data in your own program.*

BACKGROUND

The name of the sequential file containing the demographic data is *DEMOSTAT*. There are 15 data items in this file for every state, plus

the District of Columbia. Each set of data items is preceded by the two letter abbreviation of the state to which they apply. The information for each state, in order, is as follows.

1. U.S. Post Office State abbreviation.
2. 1980 population (in 000's).
3. % change in population, 1970-1980.
4. Population density (people/square mile).
5. 1980 Population % male.
6. 1980 Population % urban.
7. 1980 Over-25 Population % with college degrees.
8. Median age.
9. # of people below poverty level (in 000's).
10. Married spouse households (in 000's).
11. Single spouse households (in 000's).
12. Non-married households (in 000's).
13. # occupied housing units (in 000's).
14. Per capita income, 1980 dollars.
15. Median monthly mortgage costs (owner-occupied, noncondominiums, single family houses).
16. Median monthly rent.

These data items are always in the same order for each state; the states themselves are in no particular order. These data items are separated by carriage returns within the file, and all of the data is stored as standard ASCII characters. Thus, you can print the file *DEMOSTAT,* or call it into a standard editor, if you want to see the data itself. To retrieve, manipulate, and report this demographic data, you would do well to use the accompanying program *DEMOREAD.*

DEMOREAD is a very simple BASIC program. All it does is read the data present in *DEMOSTAT* into two variables: ST$ and S. The first variable, ST$, is a 51-element character array, which receives all the two-letter state abbreviations when the data file is read. S is a 51-by-15 numeric array which receives the 15 demographic statistics for each state when the data file is read.

DEMOREAD fills one other variable, L$. This 15-element character array is filled with a short label for each of the 15 demographic items. These labels are not in the data file. They are in the *DEMOREAD* program itself in a DATA statement from which they are read into L$.

THE DATA FILE IS READ INTO MEMORY

START-UP

To execute *DEMOREAD,* you must be in Applesoft BASIC under DOS 3.3. Then put the *A+ Disk Magazine* diskette in the default drive and type:

```
RUN DEMOREAD  RETURN
```

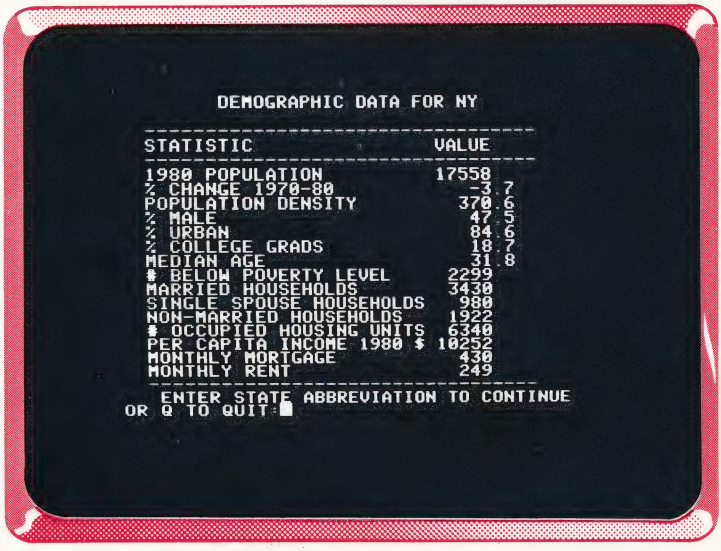
The screen will be cleared and the program will tell you it is "READING DATA." When the reading process is complete you will see the message "DEMOGRAPHIC DATA FILE READ." The three key variable arrays, ST$, S, and L$ are now filled.

At the end of the file reading portion of DEMOREAD, there is a subroutine that allows you to list the statistics for each state. You will be prompted to enter the two-letter U.S. Postal abbreviation of the state for which you would like statistics displayed. Complete your

choice by pressing the RETURN key. At the end of each statistics screen display, you are given the opportunity to enter another two-letter state abbreviation to display the statistics for another state. If you want to end the program, type

Q RETURN

This will return you to Applesoft BASIC with the three variable arrays ST$, S, and L$ still available for use.



Sample statistics for New York State

YOU CAN USE THE DATA READ BY THE PROGRAM FOR DISPLAY AS IT IS, OR YOU CAN USE IT IN A PROGRAM OF YOUR OWN

To do more elaborate manipulation and display of this demographic data, you will probably want to use the file reading portion of *DEMOREAD* in a program of your own without the additional statistics display subroutine. To remove the subroutine, load *DEMOREAD* into your Apple by typing: LOAD DEMOREAD and then type:

335 RETURN

DEL 505,1000 RETURN

Now type,

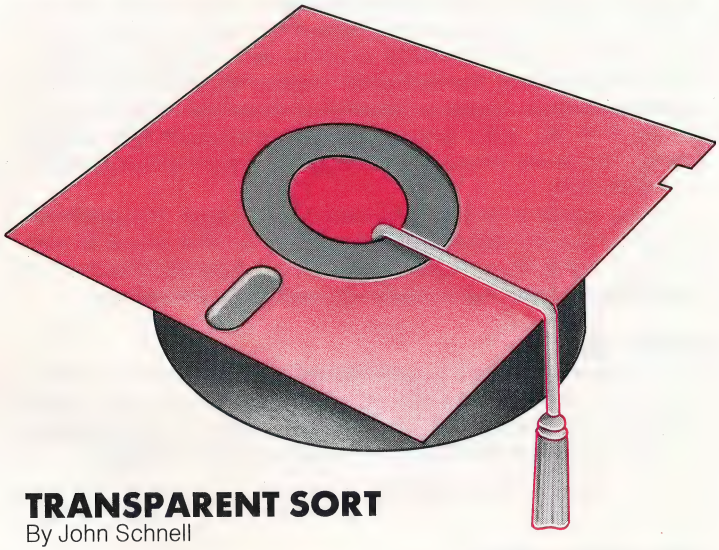
LIST RETURN

and you will see that the subroutine has been deleted from the program. You can save just this reading portion of the program, to add your own data display or manipulation code at a future time, by typing:

SAVE somename RETURN

where "somename" is a filename of your choice. Before executing this SAVE command you should replace the *A+ Disk Magazine* diskette with a work diskette so there will be space available for the saved file.

EDUCATION



TRANSPARENT SORT

By John Schnell

Special Requirements: None
Files Used: TRANSORT

Sorting is a programming technique that organizes and stores information in alphabetical or numerical order. It frees you from sequencing information manually before saving it, and becomes invaluable when you need to order hundreds or thousands of items. TRANSPARENT SORT *is a tutorial sorting program that shows the sorting process in action so that you can better understand the programming technique involved.*

BACKGROUND

A sorting subroutine is a step-by-step procedure that a computer follows in order to sort any list of items. During the sorting process, the computer compares two items at a time. If it determines that they are out of order, the items change places on the list. This procedure continues until all the items have been compared and, if necessary, exchanged.

There are two kinds of sorts: numeric and alphanumeric. A numeric sort arranges any array of numbers from lowest to highest. An alphanumeric sort orders any array of letters, words, or names alphabetically. Both sorting techniques work by comparing and swapping. However, the two sorts approach the task differently.

In a numeric sort, the computer evaluates each particular number to be sorted as a single, large binary expression. For example, the

computer reads the number 48 as 00110000. Binary expressions are compared until the items have been arranged in ascending numerical order.

In an alphanumeric sort, the computer does not evaluate each entire word as a single, large binary expression. Instead, it evaluates each letter in a word individually. Each character of the alphabet corresponds to a binary number, called its ASCII value. (ASCII stands for American Standard for Information Interchange. See the Applesoft BASIC Programmer's Reference Manual to learn more about ASCII codes.) The ASCII value for each character is itself a one-byte expression. Since the ASCII values for the letters of the alphabet range from lowest to highest in alphabetical order (e.g., A is 65 and Z is 90), letter sorting becomes very much like number sorting. The binary values of the characters are compared to determine their order.

Sorting words is only slightly more complicated. The computer compares the first letters of two words. If the first letters of both words are the same, the second letters are compared. If the second letters are the same the computer compares the third letters.

DURING SORTING, THE COMPUTER COMPARES TWO ITEMS AT A TIME

START UP

To see one way in which a computer actually performs this operation, using a method known as the Shell/Metzner sort, load Applesoft BASIC under DOS 3.3 into your Apple. Then place your *A+ Disk Magazine* diskette into your default drive and type:

RUN TRANSORT [RETURN]

THE MAIN MENU

The main menu will present four options: Transparent Sort, Non-Transparent Sort, Sort Listing, and End Program. To choose an option, press:

[←] or [→]

to move the inverse video box to the option you desire. When your choice is highlighted, press:

[RETURN]

to make your selection.

Start by choosing the Transparent Sort.

THE TRANSPARENT SORT

The Transparent Sort is a step-by-step visual demonstration of the Shell/Metzner sort. If you select this option, you will reach a second menu. You must choose some initial arrangement for the 26 letters which you will then see being sorted into ascending alphabetical order. Each initial arrangement will give different final sorting statistics depending on how scrambled the letters are to begin with. To select an option, move the inverse video line up or down by pressing:

[←] or [→]

When the desired option is highlighted, press:

[RETURN]

to make your choice.

Note that you can create your own starting order for the letters to be sorted by using the "Select Your Own Alphabet" option and following the on-screen prompts. When you have decided on the initial arrangement of the letters, type:

RETURN

and the main display will appear. It is on this screen that you can see the sort run.

Press any key to start the demonstration. Once it has begun, you may control its speed by pressing keys 1 (fastest) to 9 (slowest). The default speed is set at 3. You may also single-step through the

THIS PARTICULAR EXAMPLE USES 26 LETTERS

VARIABLES
(INTERVAL) I = 6
(END OF PASS FLAG) F = 20
(PROGRESS POINTER) P = 12
(LOW SUBSCRIPT) L = 12
(HIGH SUBSCRIPT) H = 11
(LOW STRING) A$(L) = A
(HIGH STRING) A$(H) = I
(TEMP STRING) T$ = K
STATISTICS
(# OF STATEMENTS EXECUTED) = 222
(# OF COMPARISONS MADE) = 26
(# OF EXCHANGES MADE) = 13
(# OF PLACES BTW'N ITEMS) = 6
(# OF THIS PASS) = 2
<SWAP NO>
<STEP>
LOW SUBSCRIPT SET = TO POINTER

Visual demonstration of the Shell/Metzner Sort

program, one statement at a time, by pressing the Space Bar. To restart continuous running, press any numeric key. In order to cancel the sort and return to the main menu, press:

M

During a sorting run, the 26 letters to be sorted are displayed across the center of the screen. The letters will switch positions as dictated by the BASIC program statements being executed. The current BASIC program line appears in the "current line" box above the alphabet, while an associated explanatory message appears at the bottom of the screen.

Arrows moving below the alphabet indicate the items being compared and the position of the Flag and the Progress Pointer.

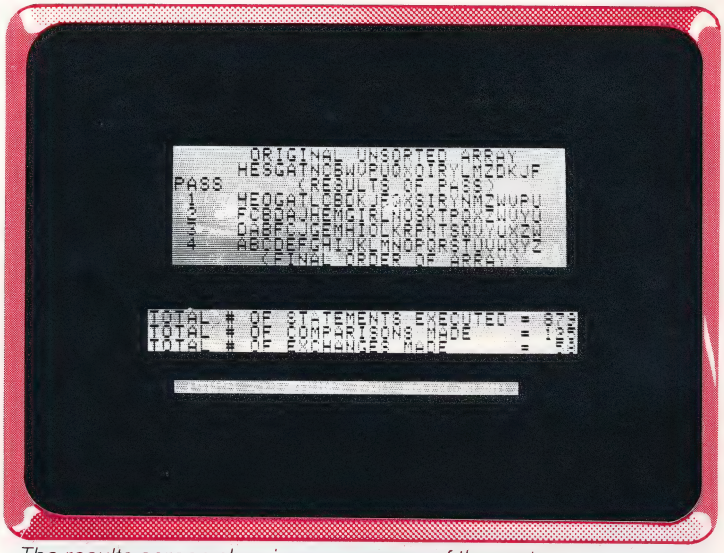
As you watch the sorting process, you will better understand the principle behind the Shell/Metzner sort. Generally, the program makes four passes on the letters, ordering them more accurately each time. On the first pass it compares each letter with the letter thirteen places after it, and swaps them if they are out of order. On the second pass it will compare letters six places apart, on the third pass, 3 places apart, and on the final pass, one place apart.

If, beginning with the second pass, the program switches two let-

ters, it will also compare the lower swapped letter with the letter six places earlier, and exchange them, too, if necessary. By repeating this process at each level, the computer reaches the final order.

The box at the top of the main screen displays the status of each variable, some pertinent statistics about the level of the program, besides the current line of the BASIC program. It updates these items after each program line.

BY REPEATED SWAPPING AT EACH LEVEL, THE COMPUTER REACHES THE FINAL ORDER



The results screen showing a summary of the sort

At the end of a sorting run, another display will show the original array of 26 scrambled letters, the arrangements after each pass, the final sorted array, and the final statistical totals for the sort.

NON-TRANSPARENT SORT OPTION

The Non-Transparent Sort option demonstrates the true sorting speed of the Shell/Metzner sort. (The fastest setting in the Transparent Sort mode is many times slower than an actual sort.) If you select this option, you will again see a second menu from which you can make an initial arrangement just as you made in the Transparent Sort.

THE SORT LISTING

The Sort Listing option displays the following BASIC subroutine:

```
510 I=26
520 I=INT(I/2)
530 IF I=0 THEN RETURN
540 F=26-I
550 P=1
560 L=P
570 H=L+I
580 IF A$(L)<=A$(H) THEN 640
590 T$=A$(L)
600 A$(L)=A$(H)
```

```
610  A$(H)=T$
620  L=L-I
630  IF L=>0 THEN 570
640  P=P+1
650  IF P>F THEN 520
660  GOTO 560
```

This sorting method, or algorithm, is called a "Shell/Metzner sort", after its originator, D.F. Shell, and its improver, M. Metzner. It is an efficient sort, having a variety of applications. This particular demonstrative application alphabetizes 26 letters. The subroutine can be clarified as follows:

Line 510 sets the value of I to the total number of items to be sorted (in our case 26).

Line 520 calculates the interval (number of spaces) between the two items to be compared.

Line 530 ends the sorting process when the interval between items reaches zero.

Line 540 sets the position of the end of pass Flag.

Line 550 sets the position of the Progress Pointer.

Line 560 sets the low subscript (L) to the value of the Progress Pointer.

Line 570 establishes the number of places between the two items being compared.

Line 580 compares two items in the list A$. If no swap is made, then the program jumps to line 640. If a swap is to be made, the program goes on to line 590. Lines 590-610 perform the swap.

Line 590 stores the value of the low item in temporary storage (T$) so it will not be lost.

Line 600 copies the contents of the high item storage into the low item storage.

Line 610 moves the contents of the temporary storage into the high item storage. The swap is now complete.

Line 620 reduces the value of the low subscript by the amount stored in variable I.

Line 630 asks if the low item is equal to or greater than one. If it is, the program jumps back to line 570 where a comparison between the item just moved and another lower item can be made, with the possibility that it will be moved even further down the list.

Line 640 moves the Progress Pointer to the next higher item.

Line 650 asks if the value of the Progress Pointer is greater than that of the Flag. If it is, we have reached the end of this particular pass and the program jumps to line 520.

Line 660 routes the program back to line 560 where the process starts on two new higher items.

If you wish to use a sort in your own program, you need only insert these 16 lines and change the variables to correspond with the rest of your program.

You can stop the program while in the Transparent Sort mode by pressing:

M

This will return you to the main menu. You can then select the "End of Program" option to return to Applesoft BASIC.

THE BINARY VALUES ARE COMPARED TO DETERMINE THEIR ORDER

UBMISSION PROCEDURE

What sets *A+ Disk Magazine* apart from most other publications is that we want and need your direct involvement. That's why we developed the "Software Submission Plan." If you're interested in submitting software you've developed either on your own or with others, let us know, and we'll send you the Submission Plan booklet. We would like to give you an outline of our Submission Plan here in order to stimulate your imagination and your interest.

The Software Submission Plan provides an opportunity for software authors to profit directly from their work. Under the plan, *A+ Disk Magazine* pays every published author a royalty on every issue sold, which contains a copy of his or her software. Best of all, this opportunity comes without elaborate restrictions. Our desire is to license software for publication only for the disk magazine format.

To explore the considerable opportunities for publication in *A+ Disk Magazine*, write to us and ask for a Software Submission Plan booklet. The address is:

A+ Disk Magazine
Author Submissions
One Park Avenue
New York, N.Y. 10016

Once you've received the Submission Plan, read it over carefully. If you feel your software fits the requirements set out in the plan, complete the enclosed Software Submission Agreement and return it to us. No program code or documentation should be sent along with the Submission Agreement.

Following receipt of the Submission Agreement, the editors of *A+ Disk Magazine* will evaluate the submission. At that point, we'll either indicate a lack of interest in the software or, if we are interested, we'll issue a submission authorization number and ask you to provide us with an executable copy of the program along with documentation on 5¼" diskettes. Again, no material should be sent until you receive a submission authorization number.

If we subsequently decide that we would like to publish the software in *A+ Disk Magazine*, we will offer a Software Contract, which will include such items as royalties, advances, and program and documentation changes required (if any). You will be asked to complete and test any program modifications agreed to in the Software contract, and *A+ Disk Magazine* will conduct a formal validation of the program and documentation.

We estimate that this process, from our initial evaluation to publication, takes approximately 3 to 6 months. This estimate is dependent upon a number of factors, and the process may take more or less time for your submission.

We look forward to hearing from you.

EDUCATION

BANK IT

By Psychotechnics Inc.

Special Requirements: None
Files Used: BANK IT
TELEMATH
TELEMATH.1
TELEMATH.2
TELEMATH.3
TELEMATH.4
TELEMATH.5
TELEMATH.6
TELEMATH.7
TELEMATH.8
TELEMATH.9

Here's a fun game to help your child increase his or her basic math skills. BANK IT *by Psychotechnics Inc. combines the excitement of a "race against the computer" with amusing color cartoon graphics and a structured approach to learning. The program builds step-by-step as your child responds to each question.*

BACKGROUND

Here's how it works. When starting the program, the student is asked to choose whether or not to play with sound. Then the student enters a code for his or her initials. Each of these steps develops your child's skill and ease in using the computer to find and enter

information. Once the preliminary questions have been answered, the student presses the RETURN key to play. Then, the race is on!

When the first problem appears on the screen, you will see two piggy banks along with a field displaying coins and bills in various combinations. The object of the game is to determine the total amount of money in the field within the time allotted. The student must use the number keys to enter the answer, and remember to include the decimal point. If the student enters the correct answer before "Time's Up!" flashes on the screen, the money is deposited in his piggy bank. If he takes longer than the time limit, or if his answer is not correct, the money goes into the computer's piggy bank. The first player to bank $10 is the winner.

THE FIRST PLAYER TO BANK $10 IS THE WINNER

A unique feature of *BANK IT* is the special hidden teacher/parent option. This option allows the allotted response time to be increased or decreased. In this way, you can monitor the student's progress and increase the speed of the game along with his increasing skill. This feature also insures that the student will not become frustrated by a program which proceeds faster than he can reasonably handle.

START-UP

To start *BANK IT,* you must be in Applesoft BASIC under DOS 3.3. Then put your *A+ Disk Magazine* diskette into the default drive and type:

RUN BANK IT [RETURN]

You will then be asked:

Do you want sound?

If you would like a little musical encouragement to begin the game, type "1" for yes, otherwise type "2" for no. Then the Telemath title page will appear and you must type:

O

to bring on the main menu. The main menu for *BANK IT* has two options:

? = Help

RETURN = Play

To learn the rules of the game, press:

?

The help screen will give you a quick review. Once you have reviewed the rules, press:

[RETURN]

to begin to play *BANK IT*. If you do not need the help review, press:

[RETURN]

to proceed directly to game play.

In addition to these two designated options, a special hidden teacher/parent option is available. To use this option, type:

7714

when this main menu is displayed. No following RETURN key is necessary and no numbers will appear (echo) on the screen.

The teacher/parent option screen that then appears will indicate the program's current student response time in seconds. The standard response time for *BANK IT* is 30 seconds. Using the numeric keys, you can type in a new number to either increase or decrease the number of seconds allotted to solve each *BANK IT* problem. Press the RETURN key to register your new time setting. Once a new response time has been chosen, it will be in effect until you end the current run of the program. If you wish to leave the current response time as is, just press:

RETURN

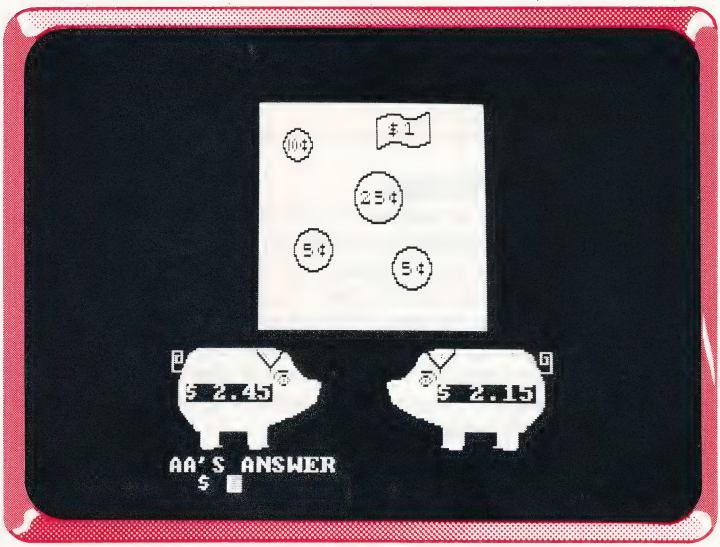
This feature allows you to adjust the program to the student's skill level while allowing him the independence of playing the game himself. Once a time is set, the program will automatically return to the main menu.

Before the game begins in earnest, the student must name his piggy bank. The last screen to appear before beginning play displays a chart listing the numbers 1 through 26. Each number corresponds to a letter in the alphabet. The student will be asked to pick the number beside his first initial and to enter that number; then to repeat the process for his last initial.

YOU SET THE ALLOTTED PROBLEM RESPONSE TIME

PLAYING THE GAME

The subsequent game screen displays two cartoon piggy banks—and one of them has the student's initials right under it! The other piggy bank is called "A+." This is your opponent, the computer. Above the piggy banks the student will see a field displaying coins and bills. He must quickly add up the money and enter it in his piggy bank before the computer flashes "Time's Up!"



The game screen—money in the bank

If he beats the computer, the money trickles down into his piggy bank and the screen flashes "That's Right! Get ready for next problem."

If he gives an incorrect answer, the money goes into the computer's piggy bank and the screen flashes "You Missed! Right answer is: --------" The correct amount is displayed, and then the program proceeds to the next problem.

THE GAME GOES TO $10

The game continues until the student's piggy bank or the computer's piggy bank contains at least $10. At the end of the game the winner's piggy bank flashes on the screen announcing "(player's initials) is the Winner!" This message will keep flashing until you press:

ESC

to return to the main menu for another game.

EXITING

Pressing the following keys simultaneously:

CONTROL RESET

at any point while playing the game will return you to the Help or Play main menu. You may change the response time using the hidden ("7714") parent/teacher code described in the Start-Up section.

Thus, once you have helped the student set up the program, he or she can continue to play *BANK IT* with a minimum of supervision by pressing:

CONTROL RESET

after each game to return to the main menu and then pressing:

RETURN

when the main menu reappears to start a new game. When you want to end the program, return to the main menu and then press:

CONTROL RESET

again. You will exit *BANK IT* and will be back in Applesoft BASIC.

ABOUT THE AUTHORS

BANK IT is one of 80 educational computer games distributed by Psychotechnics Inc., geared to the learning needs of children from kindergarten through eighth grade. As the programs were designed, they were carefully evaluated through pre-testing and post-testing of children in hundreds of school systems. Further information, as well as packages of the programs themselves, are available directly from Psychotechnics Inc. We hope to offer additional selections from this superior library of educational software in future issues of *A+ Disk Magazine*.

ZD 2003W

SHAPE MAKER

By Jason Winshell

Special Requirements: None
Files Used: SHAPE MAKER

If you have ever attempted to create your own graphics for the Apple Computer you know it can be a difficult process. In most cases it requires drawing your design on graph paper and then plotting the points on the X and Y axes. If you do not care about appearances, you can use the low resolution graphics mode on your computer. However, if you want fine lines albeit with fewer colors, then you can use the high resolution (hi-res) mode. The hi-res mode breaks the screen down into 53,760 points (280 columns by 192 rows) which can be combined to create sharp, clear graphics.

Until now you've probably limited your graphics to fairly simple designs. SHAPE MAKER *simplifies the process of creating the shape tables necessary to produce hi-res graphics. Instead of us-*

ing graph paper to plot your design you can just call up a matrix on your screen and draw your shape with the help of the program's directional keys.

BACKGROUND

The Apple II, II+ and IIe all have two color display modes. The first and simpler mode is the Low Resolution Graphics mode. In this mode the computer divides the screen into 1,920 locations, 48 blocks high and 40 wide. In low-res graphics, the Apple can generate sixteen different colors. To get a general idea of the low-res graphics, get into Applesoft BASIC and type:

```
GR  RETURN
COLOR = 15  RETURN
PLOT 20,20  RETURN
```

THE HI-RES MODE ON YOUR APPLE PLOTS POINTS, NOT BLOCKS

These instructions will produce a white block in the middle of your monitor. Notice that the block is fairly large; combined with other blocks that size, it would produce very rough graphics. In order to produce the more professional looking graphics that are used in games, you must set the computer to High Resolution Graphics mode.

The hi-res mode on your Apple plots points, not blocks. The hi-res screen is divided into 53,760 of these points. By combining these dots you can construct sharp, clear graphics. However, this mode limits your choice to seven colors.

START-UP

To run the *SHAPE MAKER* program, you must be in Applesoft BASIC under DOS 3.3. Then put your *A+ Disk Magazine* diskette in your default drive and type:

```
RUN SHAPE MAKER  RETURN
```

Once the program starts, tell the computer whether you have a printer connected to your Apple. If so, answer which slot contains your printer interface card.

DEFINING NEW SHAPES

The program begins with the main menu, which appears as follows:

1. Define New Shape (old lost)
2. View
3. Store to Disk
4. Retrieve Old Shape File
5. Print Decimal Poke Data
6. Group Shape Files
7. Exit

If this is the first time you are running this program, or if you have not yet saved any shapes, you must begin by defining a shape. Press:

```
1
```

to access the plotting screen and then use the directional keys to

set your pen at the desired starting point. The directional keys are "K" for left, "L" for right, "O" for up, and "<" for down.
Once you locate your starting point, press:

RETURN

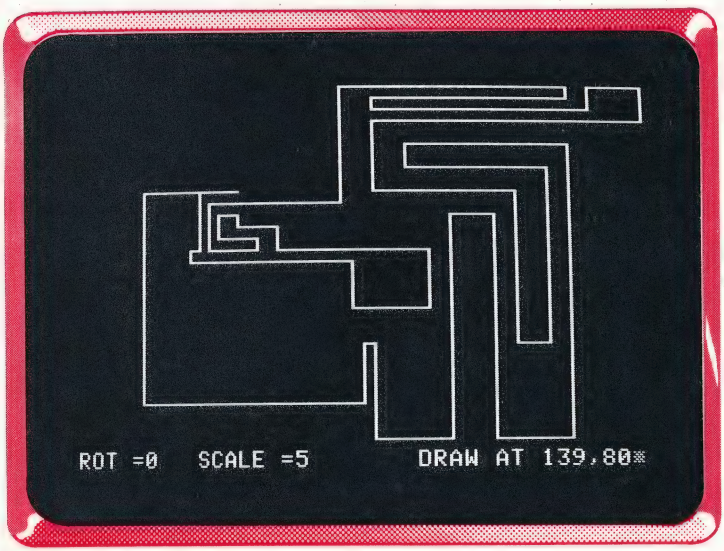
This will activate your electronic pen and allow you to start drawing a shape. As you're drawing be aware that certain keys perform special functions.

DRAW A SHAPE WITH YOUR ELECTRONIC PEN

P - turns your computer pen on and off
E - erases the screen so you can start over
F - puts the values into a shape table when you've finished your drawing. This is necessary if you wish to store your shape.
(SB) - the Space Bar is used to back up and erase one line section at a time.
(ESC) - the ESCAPE key returns you to the main menu.
Once you have created a shape, press:

F

to scan that shape and create a decimal poke file for that shape. The program will then return you to the main menu. At this point the program remembers your shape but has not yet stored it on disk. Do not create a new shape before storing the old one, or you will lose the old one.



Viewing a new shape

VIEW

Now you have the option of storing your shape or viewing it. When you press:

2

from the main menu, a very small representation of your shape will appear. Under your shape will appear the following:

Rot = 0 Scale = 1 Drawn at

Using the "S" and "X" keys enables you to increase or decrease the scale of your shape. You can also rotate the shape with the "R" and "C" keys. Pressing "R" causes a clockwise rotation of your shape. "C" reverses the rotation caused by the "R" action (hence for "C" to work you must first rotate the shape with "R"). These changes cannot be stored; they exist only to give you an idea of how you can use these shapes in other programs. To return to the main menu, press RETURN.

STORE TO DISK

This option allows you to store on the disk all the shape table information from the shape you have just created. Just type in a name for your shape and it will be stored under that name with the extension ".SHAPE".

Option 4 lets you retrieve previously stored shape files. After the disk catalog, just enter the name of the shape file desired, without the ".SHAPE" extension. The file will be loaded, and you will return to the main menu.

PRINT DECIMAL POKE FILE

High resolution computer graphics are composed of line segments extending from one of the 53,760 points that make up the screen in a given direction and for a certain length. These line segments are commonly referred to as vectors. In order for the computer to draw these line segments, you must tell it the starting bit of memory (i.e. the screen point), the direction and the length of the vector. This is done by addressing a poke.

The decimal poke file can be used when programming in assembly language. It will tell the computer the starting location, the direction, and the length of each line segment comprising your shape.

GROUP SHAPE FILES

UP TO 256 SHAPES CAN BE STORED IN ONE SHAPE TABLE

Applesoft allows up to 256 shapes to be stored in one shape table. If you had three shapes in a table, commands like "draw 1," "draw 2," and "draw 3" would access them. The Group Shape Files option lets you group single shape files into a larger shape table that can be saved on disk. Note that even a single shape file must be grouped before it can be used.

Further information regarding the manipulation of group shape files in high resolution graphics can be found in the Applesoft II BASIC Programming Reference Manual (1981), pp. 92-96.

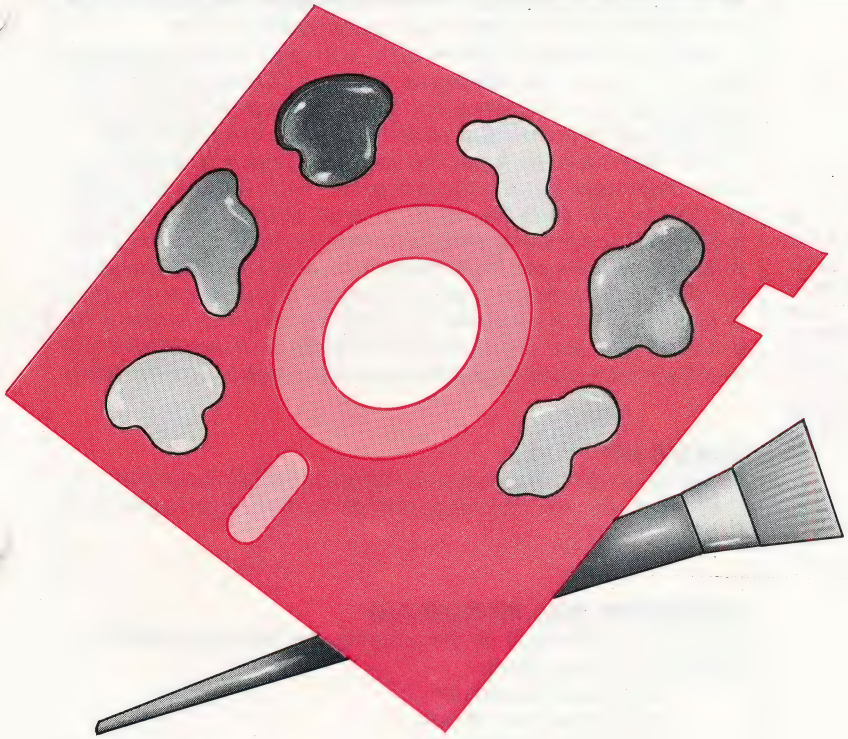
EXITING THE PROGRAM

Any time you wish to exit from this program just return to the main menu and press:

7 RETURN

Remember you must save your shapes before you leave the program. Once you exit the program anything not stored on disk will be lost.

UTILITIES



DISK MAP

By Nibble Magazine
Programmed by Vance Giboney

Special Requirements: None
Files Used: DISK MAP
MAP.BINARY

If you have ever wondered exactly where on your diskette certain information is stored and where the empty spaces are, or why the same program takes longer to run on one disk than on another, DISK MAP *will be a welcome addition to your software library.* DISK MAP *displays a complete map of the space utilization of your diskette.*

Each Apple-formatted diskette contains 35 tracks with sixteen sectors per track. These tracks are numbered hexadecimally both in this documentation and in the program. DOS occupies three of those tracks and the directory requires one, which leaves the user with 31 tracks or 496 sectors.

When you initialize a new diskette, the system places DOS on tracks 0 through 2 and the directory on track 11 (remember that's 11 in hexadecimal notation, equivalent to decimal 17). New information starts filling the disk at track 12, going to 22, and then from track 10 to 3. If you delete a file and then add another, the computer will replace the old information with the new. If there is not enough room at that old location for the new information, it will store the rest of the information on another track, splitting the new file.

When you retrieve a file from disk, DOS goes to the directory on track 11 to find out the starting sector. Then DOS reads that sector and returns to the directory to find the next sequential sector of your file. Each sector is read and loaded separately into your Apple.

ALL TRACKS AND SECTORS ARE NUMBERED HEXI-DECIMALLY IN THE PROGRAM

DISK MAP *works by extracting track and sector information from track 11 and telling the contents of each. This is where DOS stores the directory for each file, the file's name, its type, its starting address, and the number of sectors it contains. It will also trace a particular file and give you the exact location of all the sectors used by that file. This information is handy if you are trying to get a program to run faster. Since it will take the computer longer to access a file that is split up, you can consolidate that file by transferring it to a new disk which has enough free sequential space to accommodate it.*

START-UP

To use *DISK MAP*, you must be in Applesoft BASIC under DOS 3.3. Then insert your *A+ Disk Magazine* into the default drive and type:

RUN DISK MAP RETURN

RUNNING THE PROGRAM

After you have brought up the program, the following options will appear on the main menu:

M - Map a document
D - Display map of disk
F - Display file map
E - Exit from program

Before you can use any of its options, you must map a disk. Press:

M RETURN

to start the process. Now you must indicate what DOS you are using. If it is 3.3, just press the RETURN key. Next, choose a disk drive. If you have two drives you might want to leave the *A+ Disk Magazine* disk in the default drive and put your target diskette in your alternative drive. If you do not have two drives, remove your "A+" disk and insert your target disk in that drive, then press the RETURN key. It will take roughly thirty seconds to map your target disk.

Once your disk is mapped you can either display the map of the entire disk or you can use the map to locate particular files. If you decide to view the entire map, press:

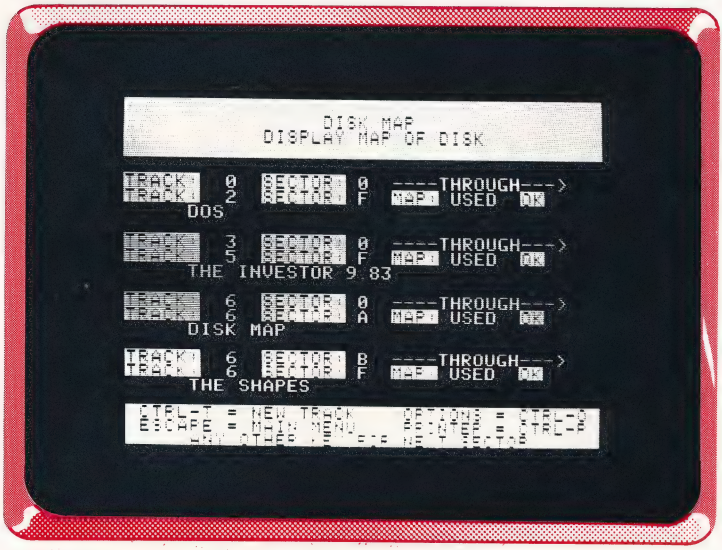
D RETURN

Now you have the option of putting the complete map on your screen or just a summary map. The summary map will list each sec-

tion of your disk that contains a different file, or part of a file, starting at track 0 and going to track 22. The complete map will list the contents of all 560 sectors.

Whether you are viewing a complete or summary map you will be

DISK MAP WILL TELL YOU THE CONTENT OF EACH TRACK AND SECTOR



Disk Map summary display

given the chance to insert the track where you would like your map to begin. If you do not insert a track number, but just press RETURN, the program will default to track 0. If you choose a number less than 22, you can subsequently display the contents of higher-numbered tracks by pressing RETURN. Eventually, by pressing RETURN enough times, you will reach the end of track 22.

When you are reviewing a complete map, or the map of a particular file, several options are available, which appear at the bottom of your display. If you would like to switch your map display to a new track at any time, this can be done by pressing:

CONTROL T

You are then prompted to enter the new track number at which you would like your map display to begin. Pressing:

CONTROL O

will return you to the map options menu. Pressing:

CONTROL P

will activate your printer, and copy the map display you see on your screen to that printer. If you are mapping a particular file, pressing:

CONTROL F

will allow you to select another file for map display. You can return to the main menu at any time by pressing:

ESC

If you would like to locate a particular file, press:

F RETURN

on the main menu. Doing so will access a catalog listing of all the files contained on the disk, and assign each a corresponding number. Just type in the file number of the file you want to see, and the following information will appear:

File Name locked or unlocked # of sectors used
Track/Sector list begins:
Track: ? Sector: ?

YOU CAN DISPLAY THE MAP OF THE ENTIRE DISK OR A PARTICULAR FILE

By repeatedly pressing:

RETURN

you will call up each sector containing a portion of that particular file in file contents order. If the file occupies only five sectors and you push the RETURN six times, you will hear a beep.

EXITING

To exit the program at any point, press:

ESC

which will return you to the main menu. Then type:

E RETURN

and you will return to Applesoft BASIC.

CALLING ALL PROGRAMMERS!!

If you have written software for the Apple II, II+, or IIe that you feel would be of use or interest to others, *A+ Disk Magazine* would like to know about it. Publishing is no longer just for poets and prosaists, but now it's for programmers too. Ask for our Software Submission Plan by writing to:

A+ Disk Magazine
Author Submissions
One Park Avenue
New York, N.Y. 10016

SEA BATTLE

By Mirror Images Software Inc.
Programmed by Philip Koopman Jr.

Special Requirements: None
Files Used: SEA BATTLE
BSHIP
BATTLE.BINARY

It's anchors aweigh with SEA BATTLE, *a simulated war game played on opposing sea grids. As captain of the home fleet, your mission is to locate and destroy the enemy fleet, while preserving the safety of your own ships.*

Both strategy and luck play a part as you and the enemy (the computer) first hide your fleets and then proceed to alternate salvos. The horizontal and vertical sea-grid coordinates are used to

specify positions for hiding ships and taking shots. Although your ships are shown on your grid, the computer cannot see them; just as you cannot see the enemy ships. When an enemy's ship is hit, a special mark indicates this fact until the end of the game.

SEA BATTLE *offers three games of increasing complexity:* STANDARD SEA BATTLE, SUPER SEA BATTLE, *and* SUPER-SALVO SEA BATTLE. *Each game can also be played with a Nighttime option, which increases the difficulty of finding the position and type of enemy ships.*

GETTING STARTED

To start *SEA BATTLE* you must be in Applesoft BASIC under DOS 3.3. Then put your *A+ Disk Magazine* diskette in the default drive and type:

RUN SEA BATTLE RETURN

After display of the title page, you will be asked whether you would like instructions. Enter "Y" to get instructions, otherwise type "N." You are then asked which of the three game options you want to play, and finally, whether you want to play with the Nighttime feature.

THE GAME SCREEN

After you have selected your options, the game screen will appear. Observe the two opposing 10-by-10 sea grids each labeled with numbers 1-10 down the left and letters A-J across the top. Positions on the grids are located using a letter/number combination, such as D2 or G9.

EACH SHIP IS A SPECIFIC LENGTH AND POSSESSES A CERTAIN AMOUNT OF FIREPOWER

Under each grid, the five ships in the fleet are on status display. Each ship is a specific length and possesses a certain amount of firepower.

SHIP	LABEL	LENGTH	FIREPOWER
PT Boat	P	2	2 missiles
Submarine	S	3	3 missiles
Destroyer	D	3	1 gun
Cruiser	C	4	2 guns
Battleship	B	5	3 guns

When a ship is hit or sunk or missiles are fired, the corresponding ship status display illustrates the action. For example, flames appear on the ship status display where it has been hit; missiles are shown firing from a PT boat or Submarine; and when a ship is sunk, a large X crosses out the appropriate status display. On the grids themselves, a ship's label letter appears in the coordinate where the ship was damaged.

Beneath the fleet status display is the prompt area where questions, warnings, and instructions help guide you through the game. The first message tells you that the enemy fleet is being hidden. It is then the home fleet's turn to hide.

HIDE . . .

You hide your ships, one by one, on the left sea-grid. A prompt will ask you to enter a letter/number combination for one end of the PT

boat first. For example, to locate the PT boat near the center of the grid, type:

E5 RETURN

A marker (X) will appear in the position indicated and another prompt will ask you if you would like the ship to extend either down (D) or to the right (R) of the marked location. Ships cannot be placed diagonally. For example, to orient the ship horizontally, type:

R RETURN

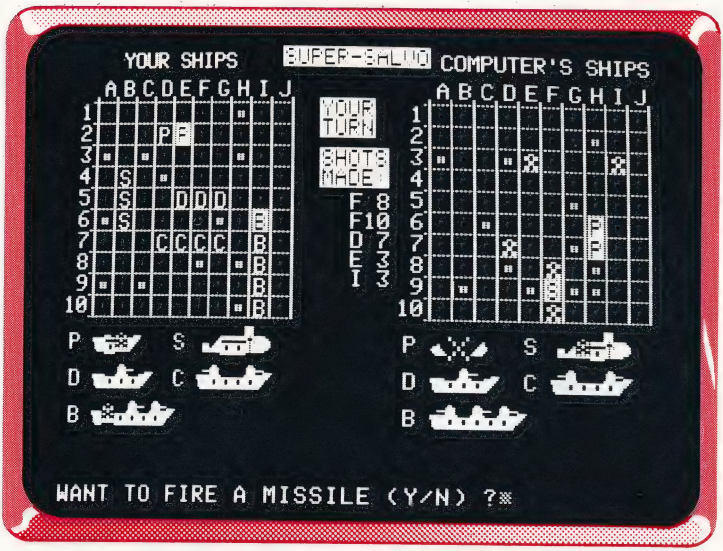
After this entry the ship's label letter will show where on the grid the ship is anchored. You will not be able to extend the ship to the left or upward of the marker. Additionally, once this initial letter/number combination has been entered, you cannot change it.

Hide the rest of your fleet in the same manner. Error messages and prompts for each ship help you through the process. After hiding the last ship (the Battleship), it is the home fleet's turn to commence firing.

THE ENTIRE LENGTH OF A SHIP MUST BE ABLAZE FOR IT TO BE SUNK

. . . AND SINK

Your home fleet starts the battle by entering a letter/number location on the enemy's sea grid. The shot is marked at that position. You may continue entering shots and firing missiles as long as you



The Game screen—battle in progress

are prompted. All shots in a single turn are listed between the opposing grids. When firing a missile you will have to specify whether the PT boat or the Submarine is launching the missile. Once a shot has been entered, it may not be changed.

When your turn is over, the enemy fires at the home fleet grid and appropriate markers will appear. After all shots from both fleets have been fired, the markers locating the shots will land one by one, either in the water or on a ship. Appropriate markers will indicate whether the shot was a hit or miss.

The entire length of a ship must be ablaze for it to be sunk. For instance, it takes three hits to sink a Destroyer. Players will develop strategies of play: e.g., seek the Battleship first, or use a systematic search procedure beginning in the corners then moving toward the center.

THE GAMES

STANDARD SEA BATTLE

a. Each fleet has only one shot each turn.
b. Missiles on Submarines and PT boats cannot be used.
c. Play ends when either fleet is entirely sunk.
d. The winner must have at least one gun or missile still afloat.

SUPER SEA BATTLE

a. Each fleet may shoot only one gun each turn.
b. One missile may be fired each turn if desired. Only five missiles are available, so use them with discretion. Once the missiles are used up the Submarine and PT boat are helpless.
c. Guns and missiles are destroyed when hit and may not be used for the remainder of the game. The status display will indicate whether any weaponry was damaged.
d. Play ends when all firepower in either fleet is destroyed or used up. All ships need not be sunk, just put out of action. A ship is out of action when its missiles are used up or all its missile launchers and guns are disabled.
e. The winner must have at least one gun or missile afloat.

SUPER-SALVO SEA BATTLE

a. Each fleet shoots all able guns each turn. Initially, each fleet has six guns afloat so you may enter at least six shots your first turn.
b. As many missiles as desired (or that remain afloat) may be fired each turn. Again, be frugal with missiles; once used, the Submarine and PT boat are helpless targets.
c. Firepower destroyed may not be used for the rest of the game.
d. Play ends when either fleet is totally defenseless. All ships need not be sunk.
e. The winner must be at least one gun or missile afloat.

THE NIGHTTIME FEATURE IMPAIRS YOU AND YOUR FLEET

NIGHTTIME

The Nighttime feature impairs you and your fleet and adds guesswork to the game. Hits on enemy ships are not recorded on the enemy's status display. On the sea grid, hits are shown with an asterisk but not marked with a label letter. This makes the game more difficult as you cannot see what ship or where on it a hit was scored. This means that you can't tell where it is wise to shoot next. Therefore, more shots are used up trying to locate the remainder of a damaged ship. Once sunk, however, the ship will be X'ed out. Enemy missiles are not displayed when fired. So it's up to you to keep track of the number of missiles fired and from which boat you think they came.

Your status is always displayed, but the computer enemy does not have this knowledge; so the same conditions apply for both fleets.

To end the game at any time, press:

RESET

and you will be returned to Applesoft BASIC.

ZD 2003M

GAMES

PYRAMID MATCH

By Paul Somerson
Programmed by Oppenheimer Software

Special Requirements: None
Files Used: PYRAMID

Here's a game in which you'll be competing against time and patience. The question is, which will run out first? It requires speed, a superb memory, and a remarkable level of accuracy. One slip and the game's over. Fortunately, though, the game is geared to beginners as well as superhumans. It's called PYRAMID MATCH, *but after a few hours of play, you may be tempted to call it something else, (something like* DIABOLICAL TORTURE, *or* TEETH GNASHER).

Here's how it works. You're presented an ever-increasing list of numbers starting with a single digit and building, play-by-play, to a

string of digits longer than you can remember. But the object is to remember them. After the line of digits is flashed on the screen, you've got to type it on your keyboard. If you do this correctly, you'll proceed to the next line in the pyramid. Don't forget, the clock is always running, so the faster you make correct responses, the better.

The game continues until you enter an incorrect number or run out of time, or decide that you should leave for a long vacation. Depending upon which level of difficulty you choose, you have anywhere from 10 to 90 seconds in which to play the game.

START-UP

To start, you must be in Applesoft BASIC under DOS 3.3. Then put your *A+ Disk Magazine* diskette in the default drive and type:

RUN PYRAMID [RETURN]

The title screen will appear with the request: "Hit any key to continue." (This is the easy part.) You are then asked if you want instructions.If you do, it won't take long to learn the game.

SELECT A LEVEL OF DIFFICULTY

Following the instructions, you select a level of difficulty. If you have never played before, choose level 1, "Drooling Infant." If you consider yourself a real expert at number games, you might try number 9 (only ten seconds in which to win the game), called "Visitor from an Advanced Civilization." If you manage to reach level 9 of the pyramid, check your birth certificate. You may very well be an alien! (If you are, you can probably create your own computer games.)

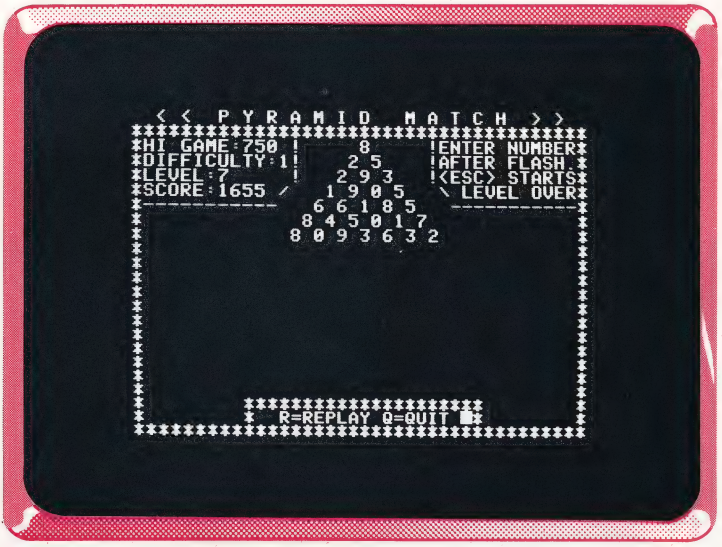
The level of difficulty sets the three features of the game: the amount of time you have to play, the length of exposure for each number, and the starting point value for your guesses. The higher the level of difficulty, the less time you have to play—10 seconds less for each higher level, from 90 seconds at level 1 to 10 seconds at level 9. Similarly, the exposure time for each guess decreases as the difficulty level increases. Lastly, the starting point value for your guesses increases 20 points for each higher level of difficulty, from a minimum of 130 points to the maximum of 290 points. Whatever the level of difficulty, each successive tier of the pyramid is worth 10 points more than the preceding one. Each request to see a number again (explained further below) subtracts 25 points from your score. So you have to decide whether it's really necessary to see a number again.

THE GAME SCREEN

Once you've selected a level of difficulty, you will see the game screen. The upper left-hand box lists the current high score (the high score for the playing session in progress, not the highest score ever), the difficulty level, the level of the pyramid you're on, and your score. The right-hand box notes that you should enter the correct number(s) following the flash on your screen. Numbers will appear only briefly, so pay attention. You can review the numbers of the current pyramid level by pressing:

[ESC]

The catch is that you lose 25 points every time you ask to see the current line of the pyramid again.



The game screen

At the start of each game you'll see a countdown (beginning with 150) in the box at the bottom of the screen. During this countdown the computer is generating the pyramid numbers for the game to be played. When the count reaches 0, the first number of the pyramid will appear at the top center of the screen. Enter that number. You don't need to press the RETURN key. As you enter each row of numbers correctly, a new row of numbers will appear until you make a mistake or run out of time. When you enter the last digit for a row, your entry will automatically register as correct or incorrect. If your entry is incorrect, the game is over. You cannot use the Left-Arrow or DELETE key to correct a response in progress. The only way to correct an entry in progress is to press the ESCAPE key and start entering your response again from the beginning. The clock is displayed in the same box as the countdown at the bottom of the screen. To spice up the game, you may consider playing a series to see who can get the highest cumulative score in a particular time interval, spanning several rounds of the game. Use strategy to select your highest scoring combination of difficulty levels. If more than one person plays, you will have to write down each person's score on a sheet of paper, because the computer will not remember the various scores.

NEW LINES WILL APPEAR UNTIL YOU MAKE A MISTAKE OR RUN OUT OF TIME

Note: When you press a number key, the computer will sound a beep to let you know that it has registered your keystroke. Sometimes a keystroke may not register, particularly at more advanced levels of the game. If you do not hear the beep when you press a number key, you must press it again until the beep sounds. Otherwise the string of digits you are typing back will not be registered properly, and the game will end with your erroneous reply.

When the game is over, you have the option to replay (R) or quit (Q). It won't be long before you wish there was a kill option as well. Good luck.

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A powerful Applesoft development tool allowing single-step program execution and easy use of traps to examine program flow.

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If you thought only pilots had "the right stuff" wait till you take up your post in this simulation of an airport control tower.

SECRET AGENT
Our first installment in an adventure game giving you the license to kill.

NOTES

NOTES

ZD 2003M

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BUSINESS

LOAN ANALYZER
Evaluate alternative fixed payment mortgage and loan agreements, with or without balloon structures. You specify the requirements, and the computer determines your payments, interest rate or loan life. Display summary payback schedules or print full schedules.

BAR CHARTER
Enter your data, bar captions and graph title on a preformatted screen. Specify your own scale, and display a full-screen horizontal bar chart on your monitor. Save your bar chart on diskette for future use.

EDUCATION

TRANSPARENT SORT
The quickest way to understand the Shell/Metzner sorting algorithm is to watch it happen step by step. Use an electronic blackboard to view the internal workings of the program at any speed you like.

BANK IT
Designed by educators, this game offers entertaining reinforcement of essential arithmetic skills. You set the speed of play to suit the learner's ability.

PERSONAL

PERPETUAL CALENDAR
Determine the day of the week for any date and the number of days between any two dates. Print the calendar for any month from the year 1800 to 2800. Use this routine by itself, or incorporate any of these functions in your own program.

DEMOGRAPHIC DATA FILE
A reference table of demographic data by state from the 1980 U.S. census. The accompanying program enables you to display the statistics for any state. Extract the file reading section to do your own reports and data manipulations.

UTILITIES

SHAPE MAKER
Build shapes and graphics for your games and business programs. Create shape tables for high resolution graphics, manipulate those graphics to any position, and contract or expand them to any size.

ISBN 0-87165-500-4

DISK MAP
This utility displays a complete map of any Apple diskette. It shows you the content type of every sector on your diskette: directory data, hidden files, bad sectors, unused sectors, etc. You can display a summary map or the map of a specific file. Useful for diskette management and educational too.

GAMES

SEA BATTLE
It's a naval engagement on the high seas, and you're Supreme Commander. Can you destroy the enemy's fleet before he destroys yours? Deploy your fleet with care, manage armaments wisely, probe enemy waters with skill and the victory can be yours!

PYRAMID MATCH
A game of high-speed memory and dexterous response. The computer presents you with ever-larger numbers that you have to repeat. Even at slower speeds the mind soon boggles.

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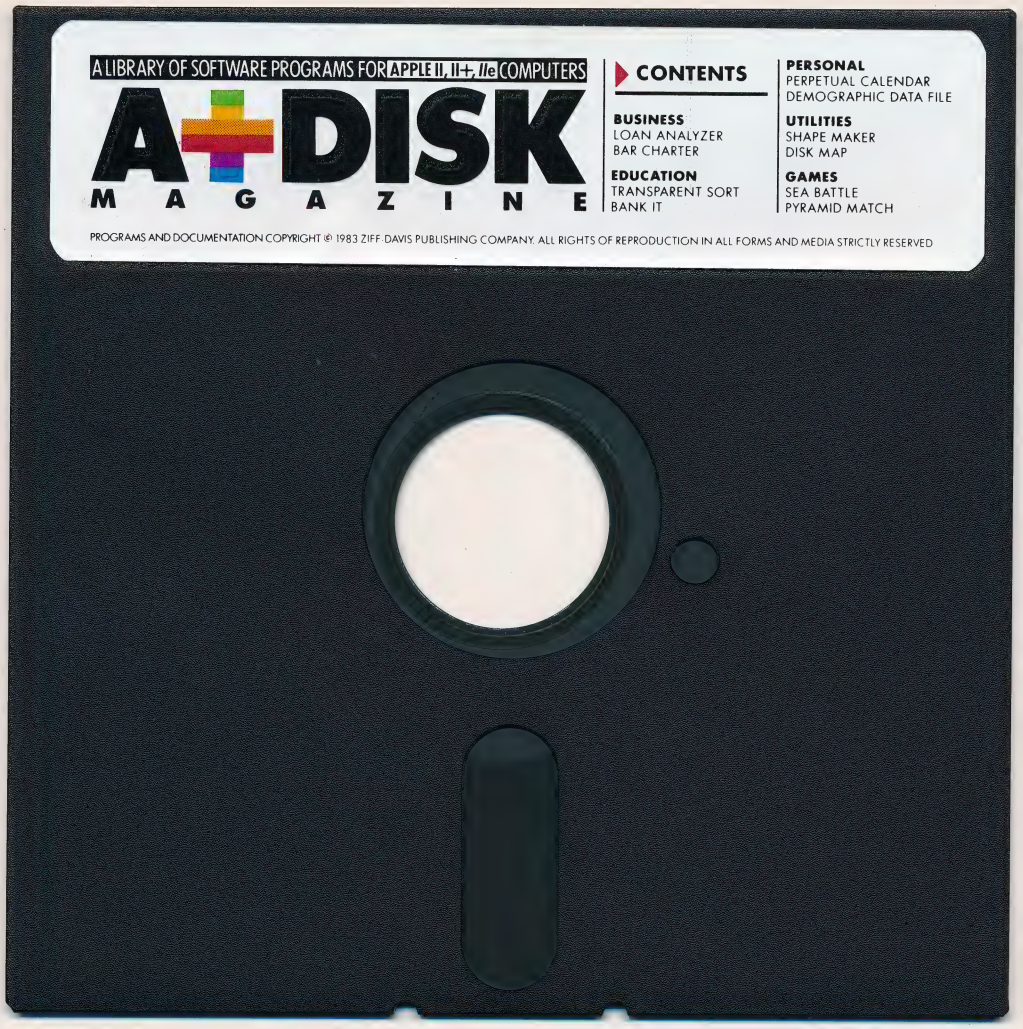
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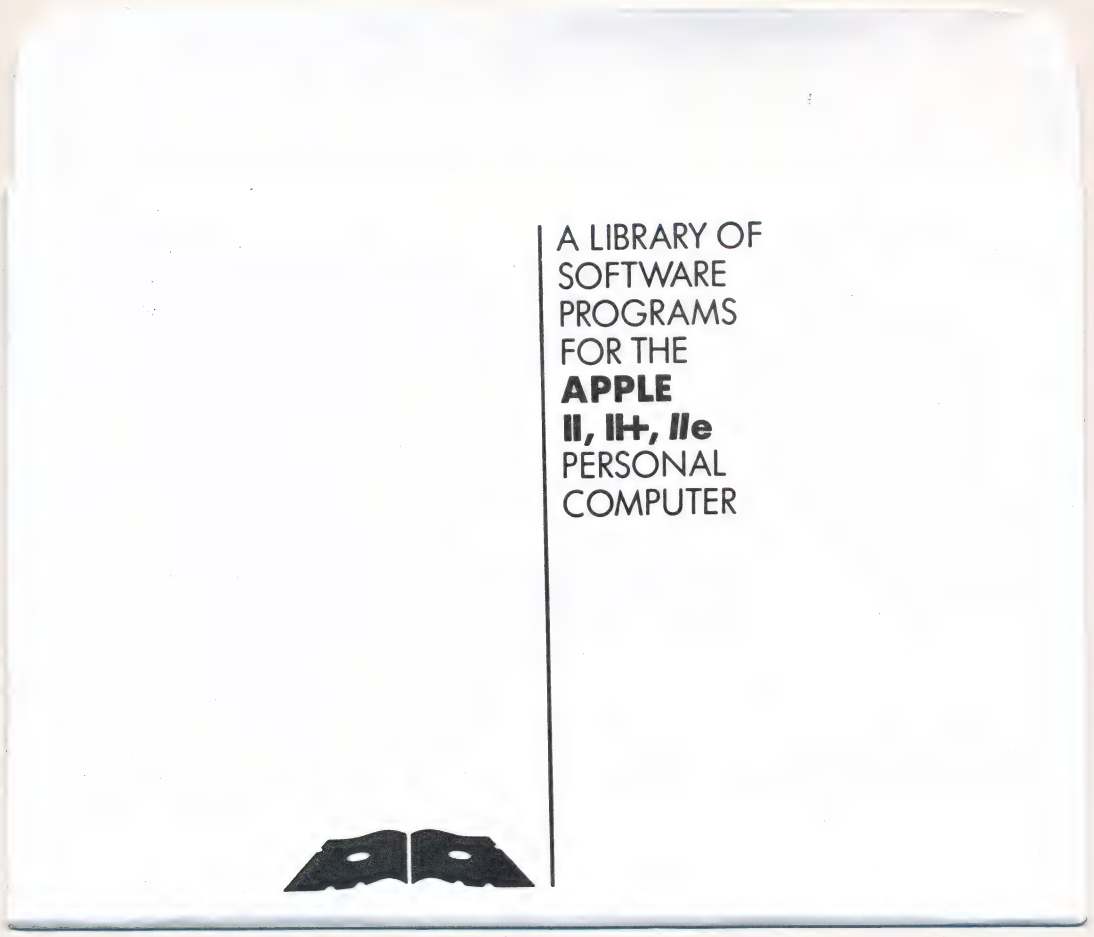
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A+DISK MAGAZINE

QUESTIONNAIRE

(To Be Completed by the Household's Primary User of the Magazine)

The questionnaire below is designed to help the editors of *A+ Disk Magazine* shape its editorial content to be of greater interest to its audience. Therefore, we would appreciate your filling in the questions below and returning this form in the envelope provided. 6-2

1. How long have you been involved in microcomputing? _____years or _____months (7-9)

2. Please provide the following information about the microcomputer you plan to use *A+ Disk Magazine* programs for.

Manufacturer _____ (10-12)
Model _____
Memory Capacity _____ (13-15)
Number of disk drives: _____ (16)
Is the disk operating system: 17-1 ☐ DOS 3.2 -2 ☐ DOS 3.3 -3 ☐ Other (Specify) _____
Is the display unit: (Check all that apply) 18-1 ☐ Black & White -2 ☐ Color
-3 ☐ Television 4 ☐ Monitor → Model: _____ (19)

3. A. Which of the following do you use with this computer? (Please check all that apply.). For each that you use, please indicate manufacturer and model.

	Use		
Hard disk	20-1 ☐	Manufacturer _____	Model _____ 21-23
Printer	-2 ☐	Manufacturer _____	Model _____ 24-26
80-Column Card	-3 ☐	Manufacturer _____	Model _____ 27-29
Language Card 1	-4 ☐	Language _____ (30) Manufacturer _____	Model _____ 31-33
Language Card 2	-5 ☐	Language _____ (34) Manufacturer _____	Model _____ 35-37
None of the above	-6 ☐		

B. Do you have a modem? Yes 38-1 ☐ What is its speed? 39-1 ☐ 300 bps -2 ☐ 1200 bps What model? _____ (40)
No

4. How do you use this microcomputer? (Check all that apply)

41-1 ☐ At home for personal purposes (not games)
-2 ☐ At home for business/professional purposes
-3 ☐ At home for educational purposes
-4 ☐ At home for entertainment purposes
-5 ☐ At office/place of work
-6 ☐ At school

5. Which of the following types of applications software do you currently use with this microcomputer? (Check all that apply.)

42-1 ☐ Accounting
-2 ☐ Payroll
-3 ☐ Modelling/forecasting
-4 ☐ Other business application
-5 ☐ Word processing
-6 ☐ Portfolio management/analysis
-7 ☐ Programming languages
-8 ☐ Graphics
-9 ☐ Education/training
-0 ☐ Household accounts
-x ☐ Entertainment
-y ☐ Other (Specify) _____ (34)

6. Is this microcomputer owned by you/a member of your household?

43-1 ☐ Yes -2 ☐ No

7. A. How long ago did you purchase or receive your copy of *A+ Disk Magazine*?

_____ weeks _____ days (44-45)

B. How did you get this copy of *A+ Disk Magazine*?

46-1 ☐ Subscription -2 ☐ Computer store -3 ☐ Book store -4 ☐ Newsstand
-5 ☐ Gift -6 ☐ Other (Specify) _____

8. A. Why did you decide to purchase (or subscribe to) *A+ Disk Magazine*?

47-1 ☐ Wanted to sample a variety of programs
-2 ☐ Had some specific program(s) in which I was interested
-3 ☐ Just curious about it
-4 ☐ Received as a gift

8. B. What other reasons did you have for deciding to purchase (or subscribe to) *A+ Disk Magazine*?

_____ 48-

_____ 49-

_____ 50-

C. In general, do you think a disk magazine is a good idea, or a poor idea. Please circle the appropriate number below.

Good idea 5 4 3 2 1 Poor idea (51)

9. A. We would like to get your reactions to each of the various programs in *A+ Disk Magazine*. First, please indicate which of the programs you have tried. (Please check all that apply.)

B. Thinking about your microcomputing activities and interests, which of the following programs are most important to you? (Please check all that apply.)

C. *For each of the programs you have tried*, please rate your satisfaction with the quality of that program. Give a program a "5" if you are very satisfied with it, give it a "1" if you are very dissatisfied and give it a "4", "3" or "2" to indicate ratings in between.

			For Each Program Tried, Are You					
	Have Tried	*Most Important Programs*	*Very Satisfied* 5	4	3	2	*Very Dissatisfied* 1	
Loan Analyzer	52-1 ☐	53-1 ☐	☐	☐	☐	☐	☐	(54)
Bar Charter	-2 ☐	-2 ☐	☐	☐	☐	☐	☐	(55)
Perpetual Calendar	-3 ☐	-3 ☐	☐	☐	☐	☐	☐	(56)
Demographic Data File	-4 ☐	-4 ☐	☐	☐	☐	☐	☐	(57)
Transparent Sort	-5 ☐	-5 ☐	☐	☐	☐	☐	☐	(58)
Bank It	-6 ☐	-6 ☐	☐	☐	☐	☐	☐	(59)
Shape Maker	-7 ☐	-7 ☐	☐	☐	☐	☐	☐	(60)
Disk Map	-8 ☐	-8 ☐	☐	☐	☐	☐	☐	(61)
Sea Battle	-9 ☐	-9 ☐	☐	☐	☐	☐	☐	(62)
Pyramid Match	-0 ☐	-0 ☐	☐	☐	☐	☐	☐	(63)

10. What kinds of programs would you like to see included in future issues of *A+ Disk Magazine*?

_____ 64-

_____ 65-

_____ 66-

11. How would you rate *A+ Disk Magazine* on each of the following?

	Excellent	*Good*	*Fair*	*Poor*	
The variety of programs included	-4 ☐	-3 ☐	-2 ☐	-1 ☐	(67)
The quality of the programs included	-4 ☐	-3 ☐	-2 ☐	-1 ☐	(68)
The quality of the documentation	-4 ☐	-3 ☐	-2 ☐	-1 ☐	(69)

12. (The following information is asked for classification purposes only)

A. What is your sex? 70-1 ☐ Male -2 ☐ Female

B. What is your age? ____ years (71-72)

C. What is the highest level of education you have attained?

73-1 ☐ Did not (yet) graduate from high school
-2 ☐ High school graduate
-3 ☐ Attended (attending) college; did not (yet) graduate
-4 ☐ College graduate
-5 ☐ Post graduate study; no advanced degree (yet)
-6 ☐ Master's degree or equivalent
-7 ☐ Doctorate

D. Aside from yourself, which other members of your household, if any, will use *A+ Disk Magazine* programs? (Please check all that apply).

	Will use		*Will use*
Male head of household	74-1 ☐	Child, age 18 or older	-4 ☐
Female head of household	-2 ☐	Child, age 15-17	-5 ☐
Other adult	-3 ☐	Child, age 12-14	-6 ☐
		Child, under 12 years of age	-7 ☐

E. What is your best estimate of your household's 1983 pre-tax income? Please include income of all household members from all sources (rents, dividends, wages, etc.) in your estimate.

75-1 ☐ Under $15,000
-2 ☐ $15,000-$24,999
-3 ☐ $25,000-$34,999
-4 ☐ $35,000-$44,999
-5 ☐ $45,000-$54,999
-6 ☐ $55,000-$64,999
-7 ☐ $65,000-$74,999
-8 ☐ $75,000-$99,999
-9 ☐ $100,000 and over
(If $100,000 or more, specify amount) _____

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